



## CPI™/A-LOK® Tube Fittings

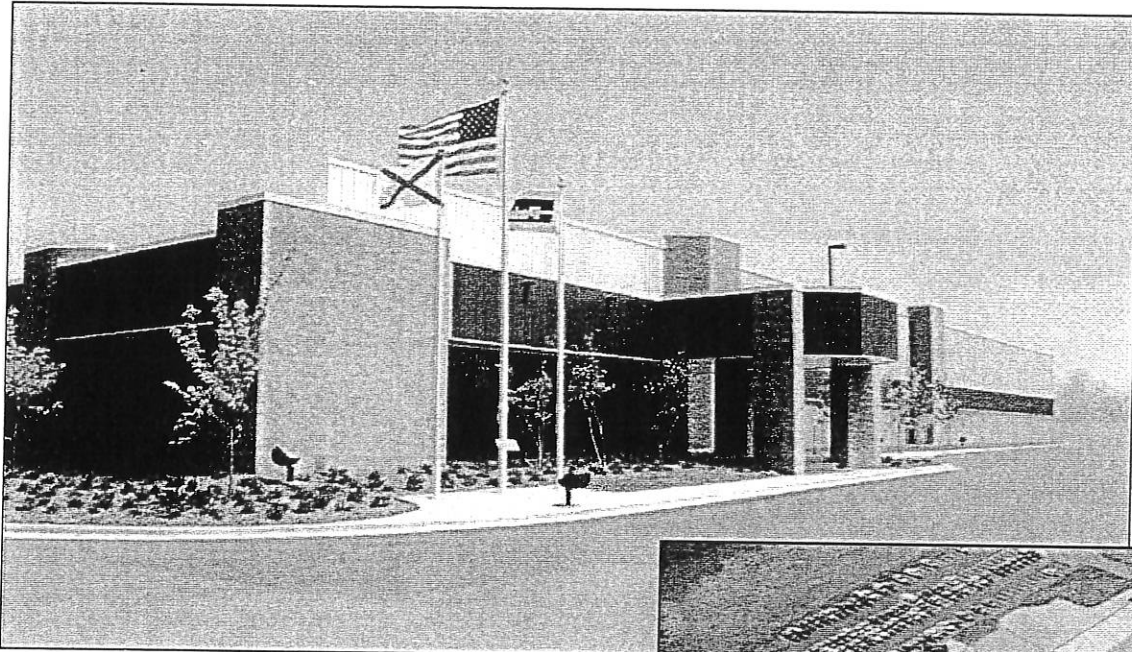
Catalog 4230/4233

June 2011

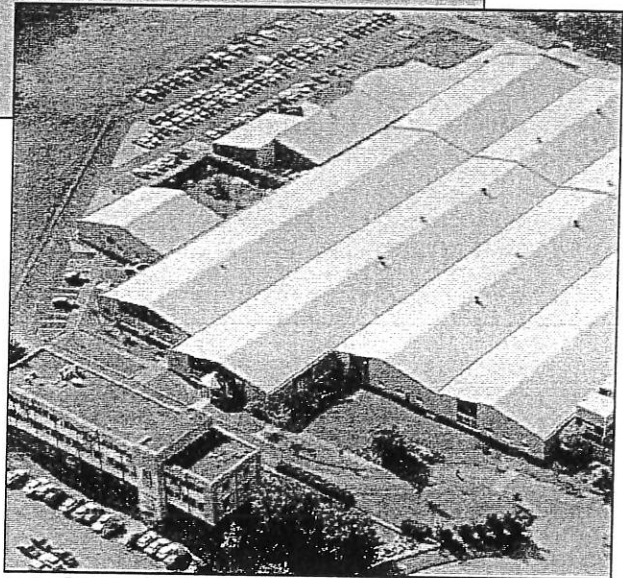
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Parker Hannifin Corporation  
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<http://www.parker.com/ipdus>

**Table of Contents**

Introduction.....2

Visual Index.....4

Typical Raw Material Specifications.....6

Tube End Dimensional Data .....6

Nomenclature (How to Order).....7

CPI™/A-LOK® Options .....8

Tube to Male Pipe Fittings.....9

Tube to Female Pipe Fittings .....21

Tube to Tube Unions.....27

Port Connectors .....36

37° Flare (AN) to CPI™/A-LOK® Fittings .....48

Tube to O-Ring Seal Fittings.....49

Tube to Welded Systems .....58

Analytical Fittings.....62

Barbed Fittings .....67

Components .....68

Assembly & Remake Instructions .....75

Gaugeability Instructions.....75

Instrument Tubing Selection Guide .....76

Thread & Tube End Size Chart (USA).....80

Offer of Sale .....84

Parker Motion & Control Technologies.....inside back cover



## Introduction

Parker CPI™/A-LOK® Instrumentation Tube Fittings are designed as leak-free connections for process, power and instrumentation applications. These single and two ferrule fittings are manufactured to the highest quality standards and are available in a broad range of sizes, materials and configurations.

## Features

The Parker CPI™/A-LOK® tube fitting has been specifically designed for use on instrumentation, process and control systems, analysers and environmental equipment employed in chemical, petroleum, power generating and pulp and paper plants. CPI™/A-LOK® fittings have also been used extensively in other applications and industries wherever high reliability and quality are required.

## Materials

Parker CPI™/A-LOK® fittings are available as standard in Heat Code Traceable, 316 stainless steel. Other materials include steel, brass, aluminum, nickel-copper, Hastelloy C®, Alloy 600, Titanium, 6Mo, Incoloy 625 and 825. The raw materials used fully conform to the chemical requirements listed in Specification Table 1 found on page 6. For nuclear and other critical applications, stainless steel CPI™/A-LOK® fittings are readily available with documented heat code traceability.

## Pipe Fittings/Adapters

Parker CPI™/A-LOK® tube fittings are available in combination with a variety of ISO and ANSI pipe thread configurations. For a full listing of these fittings, see Catalog 4260.

## Tubing

Parker CPI™/A-LOK® tube fittings can be used with a wide variety of tubing materials and a broad range of tube wall thicknesses. CPI™/A-LOK® seals equally well on both thin wall and heavy wall tubing. **Tubing and fitting materials should be selected to be compatible with the fluid media. Due to thermal expansion characteristics and chemical stability, the tubing should be of the same material as the fitting. (The exception is brass fittings and copper tubing.)**

## Torque

Parker CPI™/A-LOK® tube fittings do not twist the tubing during installation. CPI™/A-LOK® ferrule designs assure that all make and remake motion is transmitted axially to the tubing. Since no radial movement of the tubing occurs, the tubing is not stressed. The mechanical integrity of the tubing is maintained.

## No Distortion

In make-up, there is no undue force in an outward direction to distort the fitting body or ferrules to cause interference between the ferrules and nut. This assures that the nut will back-off freely for disassembly and permits a greater number of easy remakes.

## Sealing

Positive, reliable connections with Parker CPI™/A-LOK® fittings have been qualified by exhaustive tests and over four decades of experience in the manufacture of quality tube fittings.

## Nomenclature

Parker CPI™/A-LOK® fitting part numbers are constructed from symbols that identify the size and style of the fitting and material used.

## Assembly, Remake, Gaugeability

**Proper assembly is the key component to a leak-free system. CPI™/A-LOK® tube fitting assembly, remake and gaugeability instructions are found on page 75 of this catalog.**

## Pressure Rating & Tubing Selection

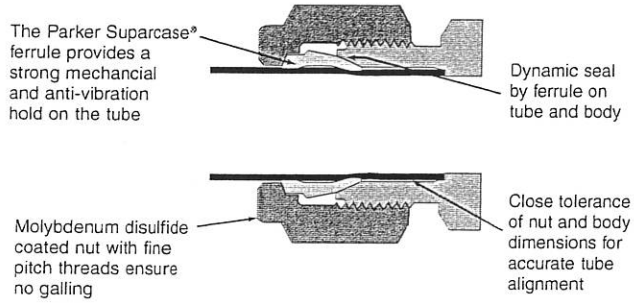
**For working pressures of CPI™/A-LOK® tube connections, please see pages 76–79 of this catalog, the Instrument Tubing Selection Guide (4200-TS) found in the Technical Section of your Parker Instrumentation Products Process Binder, or the Parker Instrument Tube Fitting Installation Manual (Bulletin 4200-B4).**

**In cases where a male or female pipe thread is the second end of a Parker CPI™/A-LOK® fitting, such threads may be the pressure limiting factor of the tubing system. Pressure ratings for Pipe Ends are shown on page 79.**

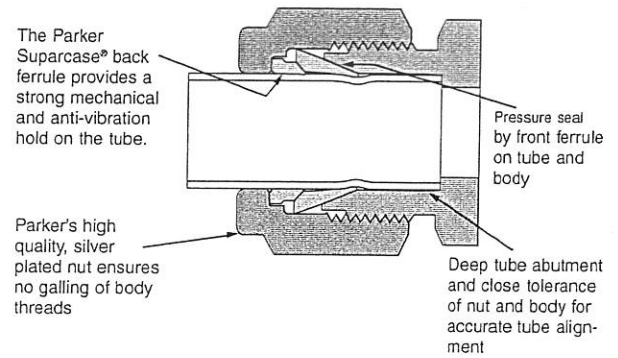
# CPI™/A-LOK® Tube Fittings

Parker CPI™/A-LOK® fittings consists of precision engineered parts designed to provide secure leak-proof joints capable of satisfying high pressure, vacuum and vibration applications.

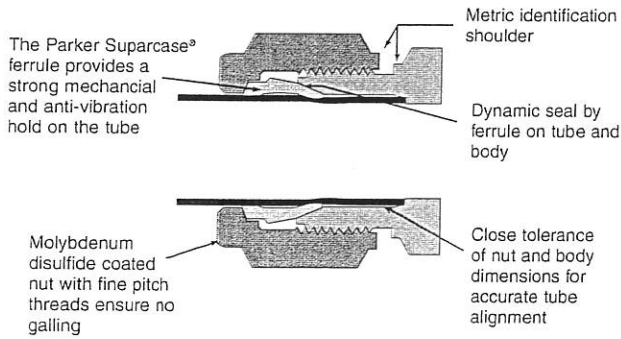
## Inch — CPI™



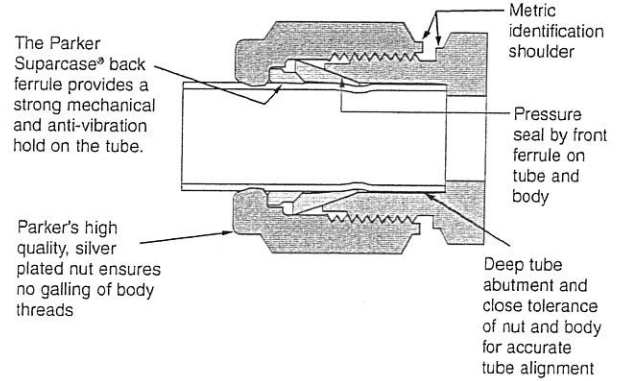
## Inch — A-LOK®



## Metric — CPI™



## Metric — A-LOK®



Parker Instrumentation Tube Fittings are supplied complete and ready to use. The ferrule(s) swage onto the tube as it moves down the body seat creating a pressure/vacuum-tight seal on both tube and body by the interface pressure and surface finish of mating components. The Parker Supercase® ferrule (back-ferrule only on A-LOK®) creates a strong mechanical hold on the tube.

## Visual Index

### Tube to Male Pipe

#### Male Connector

FBZ, MSC  
pages 9, 10,  
11, 12, 13



#### Male Bulkhead Connector

FH2BZ, MBC  
page 14



#### Thermocouple Connector

FH4BZ, MTC  
page 15



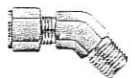
#### Male Elbow

CBZ, MSEL  
pages 15, 16, 17



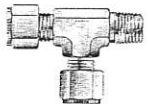
#### NPT Male 45° Elbow

VBZ, MVEL  
page 18



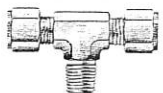
#### NPT Male Run Tee

RBZ, MRT  
page 19



#### NPT Male Branch Tee

SBZ, MBT  
page 20



### Tube to Female Pipe

#### Female Connector

GBZ, FSC  
pages 21, 22



#### Female Bulkhead Connector

GH2BZ, FBC  
page 23



#### Gauge Connector

GBZ, FSC  
pages 23, 24



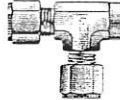
#### Female Elbow

DBZ, FEL  
page 24



#### Female Run Tee

MBZ, FRT  
page 25



#### Female Branch Tee

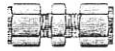
OBZ, FBT  
page 26



### Tube to Tube Unions

#### Union

HBZ, SC  
page 27



#### Conversion Union

HBZ, CU  
page 28



#### Reducing Union

HBZ, RU  
page 28



#### Bulkhead Union

WBZ, BC  
page 29



#### Dielectric Union Adapter, Dielectric Assembly

DEBTADELTA  
page 30



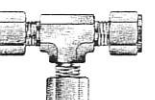
#### Union Elbow

EBZ, EE, ELZ  
pages 30, 31



#### Union Tee

JBZ, ET  
page 32



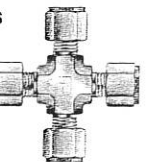
#### Drop Size Tee

JBZ, JLZ  
page 33



#### Union Cross

KBZ, ECR  
page 34



### Port Connectors

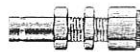
#### Tube End Reducer

TRBZ, TUR,  
TUC  
pages 35, 36, 37



#### Tube End Bulkhead Adapter

T2H2BZ,  
TUBC  
page 38



#### Port Connector

ZPC, PC  
page 38



#### Tube End Male Adapter

T2HF, MA  
pages 39, 40,  
41, 42



#### Tube End to SAE Straight Thread Adapter

T2HOA, TUOHA  
page 43



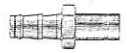
#### Tube End Female Adapter

T2HG, FA  
pages 43, 44, 45



#### Push-Lok to Tube Adapter

P2T2, P2TU  
page 45



#### Push-Lok to Male Adapter

P2HF  
page 46



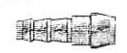
#### Push-Lok to CPI™/A-LOK®

P2BZ6, P2LZ6  
page 46



#### Push-Lok to Port Connector

ZPB2, ZPC2  
page 46



#### Lapped Joint Tube Adapters

LJFBZ, LJF  
page 47



### DP Transmitter Calibration Adapters

ZH2LX  
page 47



### 37° Flare (AN) to CPI™/A-LOK®

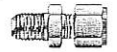
#### 37° Flare (AN) to CPI™/A-LOK®

X6HBZ6, X6TU  
page 48



#### 37° Flare Connector to CPI™/A-LOK®

XHBZ, XASC  
page 48



#### 37° Flare Bulkhead Connector to CPI™/A-LOK®

XH2BZ,  
XABC  
page 48



### Tube to O-Ring Seal

#### Male Connector SAE Straight Thread

ZHBA, M1SC  
page 50



#### Male SAE Straight Thread Elbow

C5BZ, M5SEL  
page 51



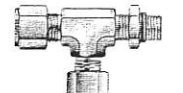
#### Male BSPP Straight Thread Elbow

CBZ, MSEL  
page 51



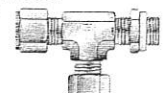
#### Male Run Tee SAE Straight Thread

R5BZ,  
M5RT  
page 52



#### Male BSPP Run Tee Straight Thread

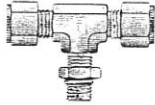
RBZ, MRT  
page 52



**Visual Index**

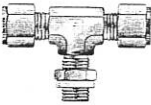
**Male Branch Tee SAE Straight Thread**

S5BZ,  
M5BT  
page 53



**Male BSPP Branch Tee Straight Thread**

SBZ, MBT  
page 53



**Long Male Connector SAE Straight Thread**

ZH3BA, ZH3LA  
page 54



**45° Positionable Male Elbow**

V5BZ, M5VEL  
page 54



**Male Connector to O-Ring Straight Thread**

ZHBA5, M2SC  
page 55



**Male Connector to O-Ring Pipe Thread**

ZHBF5, M3SC  
page 55



**Tube End to O-Ring Straight Thread**

T2HOA5, M2TU  
page 56



**Tube End to O-Ring Pipe Thread**

T2HOF5, M3TU  
page 56



**Pipe Thread to SAE Straight Thread Adapter**

FHOA  
page 57



**Bulkhead to Conversion Adapter**

AH2BZ, AH2LZ  
page 57



**Tube to Welded Systems**

**Socket Weld Elbow**

ZEBW, ZELW  
page 59



**Buttweld Elbow**

ZEBW2, ZELW2  
page 59



**Socket Weld Connector**

ZHBW, ZHLW  
page 60



**Buttweld Connector**

ZHBW2, ZHLW2  
page 60, 61



**Analytical Fittings**

**Column End Fitting — Low Internal Volume with Frit**

Z2HCZ7, Z2HLZ7  
page 63



**Column End Fitting — Low Internal Volume**

Z3HCZ7, Z3HLZ7  
page 63



**Column End Fitting — Low Internal Volume (without Frit)**

ZHCZ7, ZHLZ7  
page 64



**Column End Fitting — with Frit**

Z2HCZ, Z2HLZ  
page 64



**Column End Fitting (without Frit)**

ZHCZ, ZHLZ  
page 65



**Union Connector — Low Dead Volume**

Z7HBZ7,  
Z7HLZ7  
page 65



**Male Connector — Low Dead Volume**

FBZ7, FLZ7  
page 66



**Sanitary Flange Fitting**

ZHBS, ZHLS  
page 66



**Barbed Fittings**

**Barbed Connector to Male Pipe**

B2HF  
page 67



**Barbed Connector to Tube Adapter**

B2HT2, B2TU  
page 67



**Hose Connector Sleeve**

HCS  
page 67



**Components**

**Insert**

TIZ  
page 68



**Tube Nut**

BZ, NU  
page 68, 69



**Inverted Tube Nut**

BZI  
page 69



**Knurled Nut**

BZP  
page 69



**Ferrules**

TZ  
page 69



**Front Ferrules**

FF  
page 70



**Back Ferrules**

BF  
page 70



**Ferrule Holder**

page 70



**Plug**

FNZ, BLP  
page 71



**Cap**

PNBZ, BLEN  
page 71, 72



**Vent Protector**

MDF  
page 72



**Sealing Washers Bonded Seal and Copper**

page 73



**Bulkhead Locknut**

WLZ, WLN, BN  
page 74



**Accessory Locknut**

L5NR  
page 74



**Reference Material**

**Assembly and Remake Instructions**

page 75

**Gaugeability Instructions**

page 75

**Instrument Tubing Selection Guide**

pages 76 – 79

**Pipe End Pressure Ratings**

page 79

**Thread and Tube End Size Charts (USA/ International)**

pages 80 – 82

**Offer of Sale**

page 84

## Table 1 – Typical Raw Material Specifications

BASIC FITTING MATERIAL	MATERIAL DESIGNATOR	STRAIGHTS	SHAPES	COMMON TUBING SPECIFICATION
Brass	B	CA-360 QQ-B 626 Alloy 360 ASTM-B16 Alloy 360 CA-345 ASTM-B-453 Alloy 345	CA-377 QQ-B 626 Alloy 377 ASTM-B-124 Alloy 377 BS2872 CZ122	ASTM-B75 ASME-SB75 (TEMPER "O")
Stainless Steel (Type 316) <sup>(1)</sup>	A-LOK® = 316 <sup>(1)(2)</sup> CPI™ = SS	ASME-SA-479 Type 316-SS BS970 316-S31 DIN 4401 ASTM A276 Type 316 ASTM/ASME-SA-182	ASME-SA-182 316 BS970 316-S31 DIN 4401	ASME-SA-213 ASTM-A-213 ASTM-A-249 ASTM-A-269 <sup>(3)</sup> MIL T-8504 MIL T-8506
Steel	S	ASTM-A-108 QQ-S-637	ASTM-A-576	SAE J524b SAE J525b ASTM-A-179
Aluminum	A	2017-T4 or 2024-T4 ASTM-B211 QQ-A-225/5 or 6	2014T (as fabricated) ASTM-B-211 QQ-A-225/4	303, 6061T6 ASTM-B-210
Monel® 400 – Forgings Monel® 405 – Bar Stock	M	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-164 QQ-N-281 BS3076 NA13	ASTM-B-165
Hastelloy® C-276	HC	ASTM-B-574 ASTMB575	ASTM-B-574	ASTM-B-622 ASTM-B-626
Inconel® Alloy 600	IN	ASTM B-166 ASME-SB-166	ASTM-B-564	ASTM-B-163
Carpenter® 20	SS20	ASTM-B-473	ASTM-B-462 ASTM-B-472	ASTM-B-468
Titanium	T	ASTM-B-348	ASTM-B-381	ASTM-B-338
Inconel® Alloy 625	625	BS3076 NA16 ASTMB425	BS3076 NA16 ASTMB425	ASTM-B-625 ASTM-B-444 ASTM-B-423 ASTM-B-829
Incoloy® Alloy 825	825			
6MO	6MO	UNS S31254 UNS N08367 ASTM A479	UNS S31254 UNS N08367 ASTM A 479	ASTM-A-269

(1) If more specific information, including heat code traceability, is required, your Parker Hannifin CPI™/A-LOK® distributor will provide details.  
 (2) If an "L" appears in the A-LOK® fitting description, then the material designator will be "SS" (e.g., JLZ drop size tee).  
 (3) Stainless steel CPI™/A-LOK® tube fittings work reliably on both seamless and welded-redrawn, fully annealed type 304, 316 and 316L tubing.  
**NOTE:** Hastelloy® is a registered trademark of Haynes International. Inconel®, Incoloy® and Monel® are registered trademarks of Special Metals Corporation.  
 Carpenter® is a registered trademark of CRS Holdings Inc.

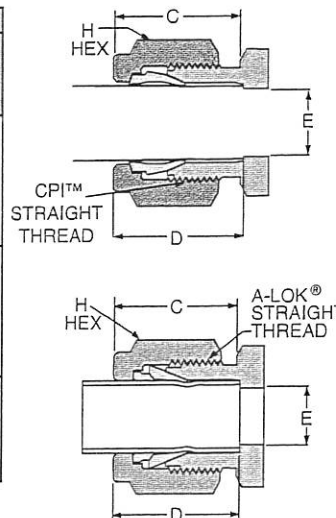
## Tube End Dimensional Data

SIZE NO.	INCHES					
	TUBE O.D.	STRAIGHT THREAD	†C	H HEX	E DIA.	†D TUBE INS. DEPTH
1	1/16	10-32	.43	5/16	.052	.34
2	1/8	5/16-20	.60	7/16	.093	.50
3	3/16	3/8-20	.64	1/2	.125	.54
4	1/4	7/16-20	.70	9/16	.187	.60
5	5/16	1/2-20	.73	5/8	.250	.64
6	3/8	9/16-20	.76	11/16	.281	.67
8	1/2	3/4-20	.87	7/8	.406	.90
10	5/8	7/8-20	.87	1	.500	.96
12	3/4	1-20	.87	1-1/8	.625	.96
14	7/8	1-1/8-20	.87	1-1/4	.750	1.03
16	1	1-5/16-20	1.05	1-1/2	.875	1.24
20	1-1/4	1-5/8-20	1.52	1-7/8	1.09	1.61
24	1-1/2	1-15/16-20	1.77	2-1/4	1.34	1.96
32	2	2-5/8-20	2.47	2-3/4	1.81	2.65

NOTE: Dimensions C and D are shown in the finger-tight position.

† Average Value

Dimensions for reference only, subject to change.



SIZE NO.	MILLIMETERS					
	TUBE O.D.	STRAIGHT THREAD	†C	H HEX	E DIA.	†D TUBE INS. DEPTH
2	2mm	5/16-20	15,3	12,0	1,7	12,9
3	3mm	5/16-20	15,3	12,0	2,4	12,9
4	4mm	3/8-20	16,1	12,0	2,4	13,7
6	6mm	7/16-20	17,7	14,0	4,8	15,3
8	8mm	1/2-20	18,6	15,0	6,4	16,2
10	10mm	5/8-20	19,5	18,0	7,9	17,2
12	12mm	3/4-20	22,0	22,0	9,5	22,8
14	14mm	7/8-20	22,0	24,0	11,1	24,4
15	15mm	7/8-20	22,0	24,0	11,9	24,4
16	16mm	7/8-20	22,0	24,0	12,7	24,4
18	18mm	1-20	22,0	27,0	15,1	24,4
20	20mm	1-1/8-20	22,0	30,0	15,9	26,0
22	22mm	1-1/8-20	22,0	30,0	18,3	26,0
25	25mm	1-5/16-20	26,5	35,0	21,8	31,3

NOTE: Dimensions C and D are shown in the finger-tight position.

† Average Value

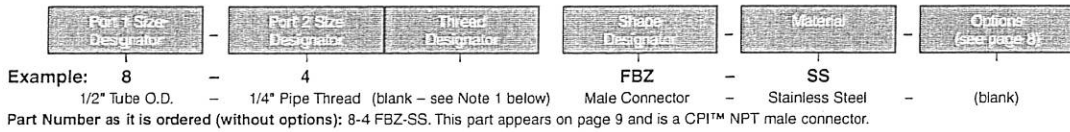
Dimensions for reference only, subject to change.



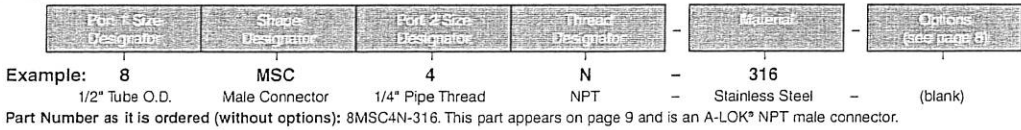
## Nomenclature/How to Order

Parker CPI™/A-LOK® tube fitting part numbers are constructed using alphanumeric characters to identify the size, style and material of the fitting.

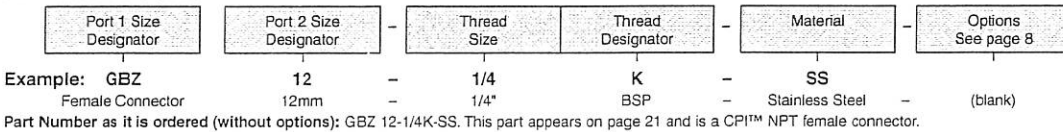
### CPI™ Inch Parts



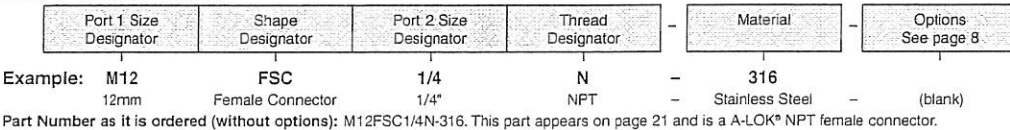
### A-LOK® Inch Parts



### CPI™ Metric Parts



### A-LOK® Metric Parts



**Body Designator:** A letter or combination of letters and numbers are used to designate the type of fitting. See the visual index on pages 4–5 for body designator.

**Fractional Size:** Tube and pipe thread sizes are designed by the number of sixteenths of an inch (1/2" tube = 8/16" = 8) (1/4" pipe thread = 4/16" = 4).

**Metric Size:** Metric tube is designated in millimeters and prefixed "M" (i.e., 12mm tube – M12.) The pipe thread size is written as a fraction (i.e., 1/4 NPT = 1/4).

**All Straights & Elbows:** Call out largest CPI™/A-LOK® tube end size first followed by the smaller CPI™/A-LOK® tube end or pipe thread size.

**Fractional Tees & Crosses:** For drop size tees – first size the run (1 to 2) and then branch (3). Example – the size designator for a male run tee for 3/8" O.D. tube and 1/4" male pipe thread would be 6-4-6. For crosses – first size the run (1 to 2) and then the branch (3 to 4). For tees with all ends the same, use the tube and size before and after the style designator; i.e. 4-4-4 JBZ (CPI™), 4ET4 (A-LOK®).

**Metric Tees & Crosses:** For drop size tees – first size the run (1 to 2) and then branch (3). Example – the size designator for a male run tee for 6mm tube and 1/4" male pipe thread would be 6-4-6. For crosses – first size the run (1 to 2) and then the branch (3 to 4). For tees with all ends the same, use the tube end size after the style designator; i.e. JBZ 4-4-4 JBZ (CPI™), ETM4 (A-LOK®).

**Material:** See Table 1 on the previous page for the material symbol.

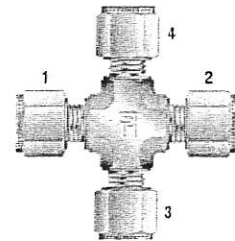
### Thread Types:

N = NPT <sup>(1)</sup> /National Pipe Taper	ANSI B1.20.1
K = BSP/ISO Taper	BS21, ISO7/1
R = BSP/ISO Parallel	BS2779, ISO 228/1+2, DIN 3852 <b>FORM A</b> <sup>(2)</sup>
BR = BSP/ISO Parallel	BS2779, ISO 228/1+2, DIN 3852 <b>FORM B</b> <sup>(3)</sup>
M = Metric Thread	ISO 6149-2
R-ED = BSPP/ISO Parallel	BS2779, ISO 228/1+2, DIN 3852 <b>with elastic sealing washer</b> <sup>(4)</sup>
GC = BSPP Gauge Connector	B2779, ISO 228/1+2, DIN 3852

- (1) N thread designator is only used for A-LOK® nomenclature.
- (2) Form A requires the use of a bonded washer. See page 73 of this catalog.
- (3) Form B (cutting face) may be used with or without a sealing washer.
- (4) ED fittings are supplied with Nitrile sealing washers as standard. Fluorocarbon seals are available upon request.

**Special Fittings:** Consult the factory. If there is any question as to the fitting desired, particularly for special fitting configurations, it is suggested that a customer print be submitted.

**Special Options:** See the following page for available options.



### Color Coding

For easy reference, table column headings are color indicated as follows:

**fractional**

**metric**

## CPI™/A-LOK® Options

Parker CPI™/A-LOK® fittings may be ordered with the following options.

### How to order

After the complete CPI™/A-LOK® number simply add a "dash" then the suffix for the option.

The following example is an A-LOK® male connector for 1/2" OD tube and 1/4" male pipe that has been cleaned for oxygen service. For additional options, please consult the factory.

8MSC4N-316-C

Suffix	Option	Additional Information
ZYF	Assembled with nylon ferrule(s)	
SPF	Silver plated ferrule(s)	
TF	PTFE ferrule(s)	
BP*	Bulk packed	* Indicates the quantity i.e BP50 for a fifty count package.
LWH	Lock wire hole	
BZP	Knurled nut	Replaces standard nut on CPI™/A-LOK® fittings for use on soft plastic tubing.
C	Silver plated nut	Replaces moly coated nut (BZ).
MI	Moly inside nut	
CNQ	Certified Nuclear Quality	
C1	Grade A Cleaning	Special cleaning, assembly, inspection and packaging for high purity applications.
C3	Cleaned for oxygen service	Meets the requirements of ASTM G93-88; Standard Practice for Cleaning Methods for Materials and Equipment used in Oxygen-Enriched Environments.
CNG	Compressed natural gas service	Assembled with a specific o-ring compound.
NIC	Nickel plated	
CRM	Chrome plated	
VO	Viton O-ring	
NC	NACE	MRO175-2003
NACE	NACE	MRO175-2002
DFARS	Defense Acquisition Regulations System	All components and raw material must be of US origin or from an approved country.

## Gaugeable Tube Fittings and Adapter Fittings

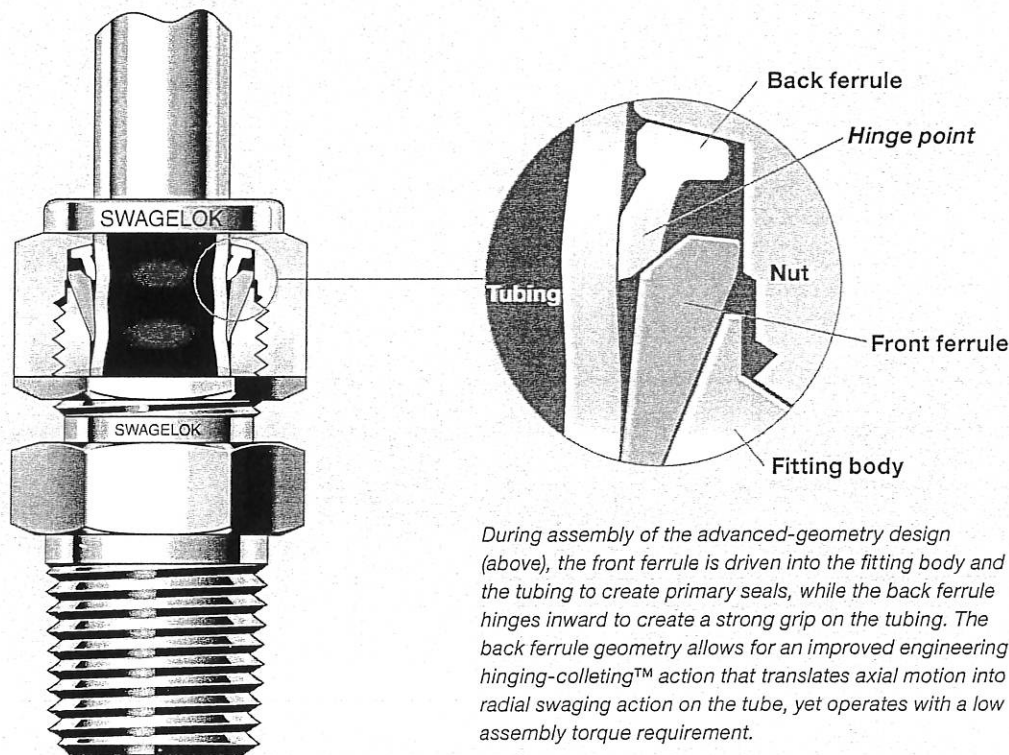


- Available in tube sizes from 1/16 to 2 in. and 2 to 50 mm
- Consistent gaugeability upon initial installation
- Easy to disconnect and retighten
- Wide variety of materials and configurations

Swagelok

## Features

- Live-loaded, two-ferrule design.
- Easy to install.
- No torque is transmitted to tubing during installation.
- Swagelok® gap inspection gauge ensures sufficient pull-up upon initial installation.



*During assembly of the advanced-geometry design (above), the front ferrule is driven into the fitting body and the tubing to create primary seals, while the back ferrule hinges inward to create a strong grip on the tubing. The back ferrule geometry allows for an improved engineering hinging-colleting™ action that translates axial motion into radial swaging action on the tube, yet operates with a low assembly torque requirement.*

### Two-Ferrule, Mechanical Grip Design

The two ferrules separate sealing and tube gripping functions; each ferrule is optimized for its function.

#### The front ferrule creates a seal:

- against the fitting body
- on the tubing outside diameter.

#### As the nut is turned, the back ferrule:

- axially advances the front ferrule
- radially applies an effective tube grip.

### Advanced-Geometry, Hinging-Colleting Back Ferrule Design

This design is standard on all 1/4 to 1/2 in. and 6 to 12 mm Swagelok stainless steel tube fittings to help installers make more consistent, leak-tight tube connections.

In these sizes, a patented case hardening process and patented recessed and contoured geometry provide unique engineering to the Swagelok back ferrule. The hinging-colleting back ferrule design expands on the already robust performance of the traditional ferrule design and provides:

- excellent gas-tight sealing and tube-gripping action
- easily achieved proper installation
- consistent remakes
- excellent vibration fatigue resistance and tube support
- full compatibility with original Swagelok stainless steel tube fittings of identical sizes.

For additional information, see the *316 Stainless Steel Swagelok Tube Fittings with Advanced Geometry Back Ferrules* technical report, MS-06-16.

## The Swagelok Tube Fitting Advantage

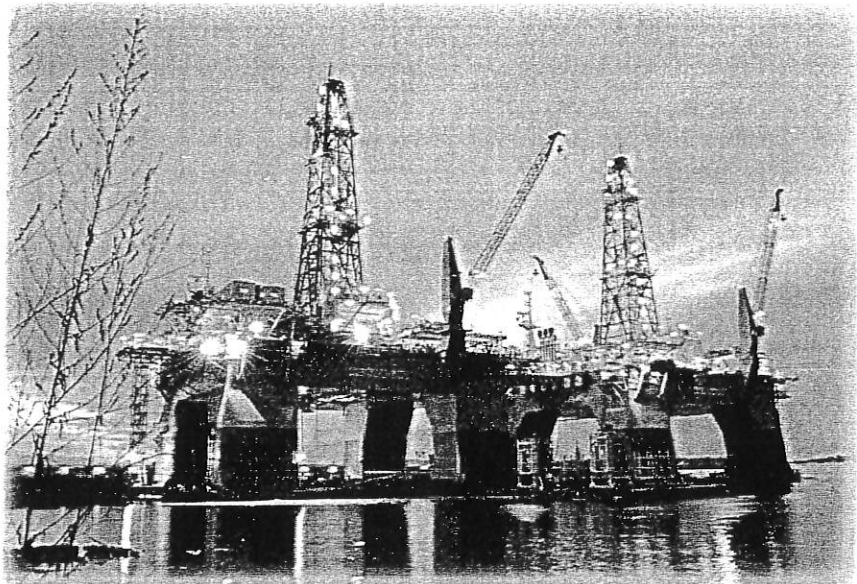
*“Over 10 000 fittings  
and not a single leak.”*

That is the message one customer wanted to share, crediting Swagelok components and tube fittings along with Swagelok distributor support, as having played a major role in completing—and obtaining independent, third-party certification for—two 12 000 ton oil rigs.

And that is part of the ongoing story behind the continuous improvement efforts that Swagelok has initiated and sustained since the development and patent of the original two-ferrule tube fitting more than 50 years ago.

Today, as everyone is being called on to “do more with less” and to recognize value, Swagelok continues to improve the leak-tight design of the tube fitting for use in thousands of diverse applications—including research, analytical and process instrumentation, bioprocessing, oil and gas, power, petrochemical, and semiconductor industries—and addressing such critical issues as:

- leakage
- vibration (tube grip)
- thermal shock
- compliance with industry standards
- installation
- corrosion
- intermix/interchange.



### Leakage

Excellent gas-tight sealing and consistent reassembly help ensure accurate measurements of process parameters—air, steam, fuel, and water—to keep your plant operating efficiently. Moreover, Swagelok tube fittings minimize fugitive emissions, as well as process fluid leakage and operation costs.

From 1999 through 2004, more than 250 000 fittings in gas service at more than 400 different process installations were leak tested with Swagelok Snoop® liquid leak detector. Contact your authorized Swagelok sales and service representative for more information about Swagelok Energy Emissions Surveys or to schedule a survey.

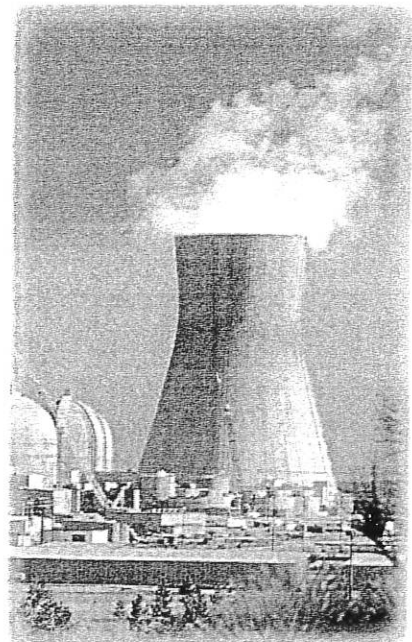
### Vibration (Tube Grip)

The patented case-hardening process and back-ferrule geometry provide excellent vibration fatigue resistance and tube support—even in harsh or stressful environments, such as fuel processing or rotary equipment applications.

Swagelok has conducted rotary flex tests, which show that the Swagelok tube fitting with advanced geometry hinging-colleting back ferrule isolates and protects the stress riser that is generated along the tube during

the gripping part of assembly. The colleting portion of the back ferrule allows more material to contact the tube, for additional support. This colleting action enhances gripping performance and provides both direct and axial support to the gripping function. This design minimizes the effects of bending deflection at the point of grip on the tubing.

Contact your authorized Swagelok representative for more information about vibration test reports.



## Thermal Shock

The elastic, live-loaded two-ferrule design compensates for changes in temperature during system start-up and shutdown and helps eliminate leakage related to rapid thermal expansion or contraction.

Swagelok has conducted tests that demonstrated the capability of Swagelok tube fittings to withstand thermal shock and high temperature.

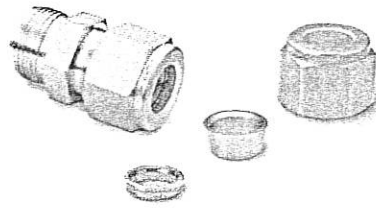
Contact your authorized Swagelok representative for more information about thermal shock test reports.

## Compliance with Industry Standards

Swagelok Company works with standards organizations around the world to provide you with products that address your needs.

See **Materials**, page 8; **Thread Specifications**, page 8; and **Pressure Ratings**, page 9, for more information about the specifications to which Swagelok tube fittings are manufactured.

Contact your authorized Swagelok representative for more information about Swagelok tube fitting certifications.



## Installation

The Swagelok tube fitting installation advantages:

- Easy to install
- No torque is transmitted to tubing during installation
- Swagelok gap inspection gauge assures sufficient pull-up upon initial installation.

Swagelok tube fitting components provide exceptional dimensional, metallurgical, and mechanical uniformity that allow predictable, repeatable installation.

Swagelok authorized sales and service centers offer installation training seminars that provide additional information on:

- The requirements for making safe, leak-tight connections
- A variety of tools and accessories designed for use with Swagelok tube fittings.

## Corrosion

Swagelok tube fittings are available in a variety of materials, including controlled-chemistry 316 stainless steel and many other alloys for enhanced corrosion resistance in a variety of applications, including sour gas and subsea systems.

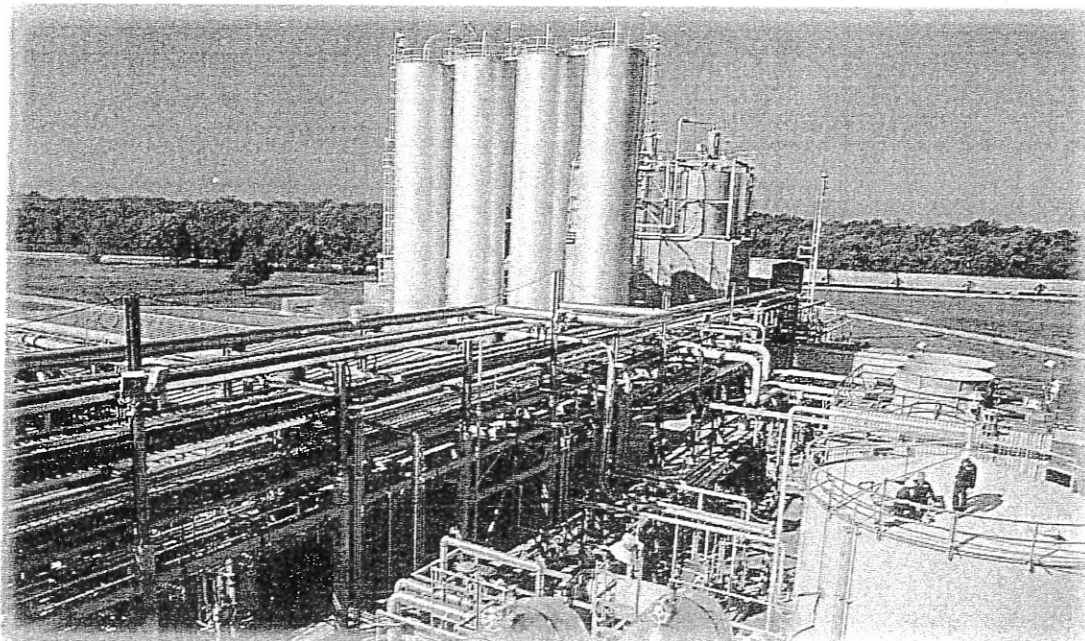
Swagelok has conducted tests in accordance with ASTM B117-95 to evaluate the corrosion resistance of Swagelok tube fittings.

Contact your authorized Swagelok representative for more information about corrosion resistance test reports.

## Intermix/Interchange

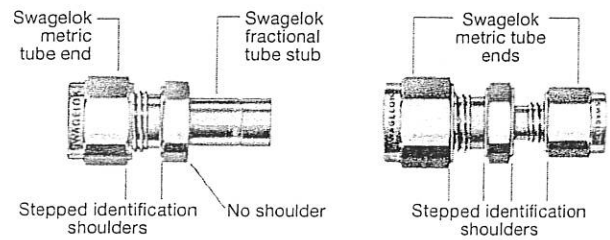
This practice can be dangerous. Leak-tight seals that will withstand high pressure, vibration, vacuum, and temperature changes depend on close tolerances and consistent, exacting quality control in conjunction with good design principles. The critical interaction of precision parts is essential for reliability and safety.

Components of other manufacturers may look like Swagelok tube fitting components—but they cannot be manufactured in accordance with Swagelok engineering standards, nor do they benefit from innovations in design and manufacture defined by 36 active Swagelok tube fitting patents issued since 1989.



### Metric Swagelok Tube Fittings

Metric tube fittings have a stepped shoulder on the body hex. Shaped fittings, such as elbows, crosses, and tees, are stamped MM for metric tubing and have no step on the forging.



### Pressure Ratings

#### Swagelok Tube Fitting Pressure Ratings

Swagelok tube fitting ends are rated to the working pressure of tubing as listed in Swagelok *Tubing Data*, MS-01-107. Careful selection of high-quality tubing is important when installing safe, leak-tight systems.

#### Pipe End (NPT and ISO 7) Pressure Ratings Basis

Pressure ratings for fittings with both tube fitting and pipe thread ends are determined by the end connection with the lower pressure rating. The table lists pressure ratings for male and female tapered pipe thread ends. For female and male pipe threads to have the same pressure rating in the same nominal pipe size, the female thread would require a heavier wall, resulting in a fitting too large and bulky to be practical.

#### Allowable Stress

Stress values are based on ASME Code for Pressure Piping B31.3, Process Piping, at ambient temperature.

Material	Allowable Stress	
	psi	bar
316 SS	20 000	1378
Brass	10 000	689
Steel	20 000	1378

#### Pressure Ratings

Ratings are based on ASME Code for Pressure Piping B31.3, Process Piping, at ambient temperature.

NPT/ ISO Pipe Size in.	316 SS and Carbon Steel				Brass			
	Male		Female		Male		Female	
	psig	bar	psig	bar	psig	bar	psig	bar
1/16	11 000	760	6700	460	5500	380	3300	230
1/8	10 000	690	6500	440	5000	340	3200	220
1/4	8 000	550	6600	450	4000	270	3300	220
3/8	7 800	540	5300	360	3900	270	2600	180
1/2	7 700	530	4900	330	3800	260	2400	160
3/4	7 300	500	4600	320	3600	250	2300	160
1	5 300	370	4400	300	2600	180	2200	150
1 1/4	6 000	410	5000	350	3000	200	2500	170
1 1/2	5 000	340	4600	310	2500	170	2300	150
2	3 900	270	3900	270	1900	130	1900	130

■ To determine pressure ratings in accordance with ASME B31.1, Power Piping:

- carbon steel material—multiply by 0.85.

Stainless steel and brass material ratings remain the same.

■ To determine MPa, multiply bar by 0.10.

#### SAE/MS Fittings Pressure Ratings Basis

Pressure ratings are based on SAE J1926/3 at ambient temperature.

SAE/MS Thread Size	Designator	316 SS and Carbon Steel			
		Nonpositionable		Positionable	
		psig	bar	psig	bar
5/16-24	2ST	4568	315	4568	315
7/16-20	4ST				
1/2-20	5ST			3626	250
9/16-18	6ST				
3/4-16	8ST	3626	250	2900	200
7/8-14	10ST				
1 1/16-12	12ST				
1 3/16-12	14ST	2900	200	2320	160
1 5/16-12	16ST				
1 5/8-12	20ST	2320	160	1813	125
1 7/8-12	24ST				
2 1/2-12	32ST				

Some fittings with AN, O-seal, and SAE/MS ends may have lower ratings. For more information, contact your authorized Swagelok representative.

#### O-Seal Pressure Ratings

Stainless steel and carbon steel O-seal fittings up to 1 in. and 25 mm are rated to 3000 psig (206 bar).

#### Positionable, ISO/BSP Parallel Thread (PR) Pressure Ratings

Pressure ratings are at ambient temperature.

ISO/BSP Male Pipe Size in.	316 SS and Carbon Steel	
	psig	bar
1/8	4568	315
1/4		
3/8		
1/2	2320	160
3/4		
1		

### Additional Ordering Information

Swagelok tube fitting ordering numbers follow the sequence shown below.

**A** - **B** **C** **D** - **E** - **F** **G**  
**SS** - **2** **0** **0** - **1** - **2** **RT**

**A** Material

- A = Aluminum
- B = Brass
- C20 = Alloy 20
- HC = Alloy C-276
- INC = Alloy 600
- M = Alloy 400
- NY = Nylon
- S = Carbon steel
- SS = 316 stainless steel
- T = PTFE
- TI = Titanium
- 625 = Alloy 625
- 825 = Alloy 825

**B** Size (Tube OD)

Fractional, in.	Metric, mm
1 = 1/16	2 = 2
2 = 1/8	3 = 3
3 = 3/16	4 = 4
4 = 1/4	6 = 6
5 = 5/16	8 = 8
6 = 3/8	10 = 10
8 = 1/2	12 = 12
10 = 5/8	14 = 14
12 = 3/4	15 = 15
14 = 7/8	16 = 16
16 = 1	18 = 18
18 = 1 1/8	20 = 20
20 = 1 1/4	22 = 22
24 = 1 1/2	25 = 25
32 = 2	28 = 28
	32 = 32
	38 = 38
	50 = 50

**E** Series

- 0 = Fractional 1/16 to 3/8 in. and 1 1/4 to 2 in.
- 1 = Fractional 1/2 to 1 1/8 in.
- M = Millimeter tube size

To order a female Swagelok tube fitting, add F.  
 Example: SS-100F-1-1.

**D** Component

- 0 = Fitting
- 1 = Body

**F** Fitting Type

- 1 = Male connector
- 2 = 90° male elbow
- 3 = Tee, union
- 4 = Cross, union
- 5 = 45° male elbow
- 6 = Union
- 7 = Female connector
- 8 = Female elbow
- 9 = Elbow, union
- 11 = Bulkhead male connector
- 61 = Bulkhead union
- 71 = Bulkhead female connector
- A = Adapter
- C = Cap
- P = Plug
- PC = Port connector
- R = Reducer
- R1 = Bulkhead reducer
- 2R = Reducing elbow
- TFT = Tee, female run
- TMT = Tee, male run
- TRT = Tee, ISO/BSP parallel male positionable run
- TST = Tee, straight thread with O-ring male positionable run
- TTF = Tee, female branch
- TTM = Tee, male branch
- TTR = Tee, ISO/BSP parallel male positionable branch
- TTS = Tee, straight thread with O-ring male positionable branch

**F** Second End Connection Size

Add a size designator from the list at left for the second end connection or if the fitting is a reducing union.

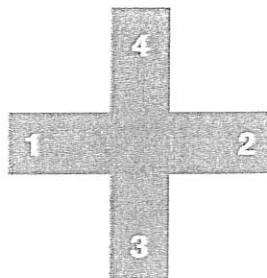
**G** Second End Connection Type

- Add a second end connection type designator as needed.
- AN = 37° male AN flare
  - ANF = 37° female AN flare
  - BT = Bored-through fitting
  - F = Female thread
  - KN = Knurled nut, nylon ferrules
  - KT = Knurled nut, PTFE ferrules
  - M = Metric tube end
  - OR = O-seal connection
  - PR = ISO/BSP positionable parallel pipe thread
  - RG = ISO/BSP parallel pipe thread (gauge)
  - RJ = ISO/BSP parallel pipe thread (Japanese gauge)
  - RP = ISO/BSP parallel pipe thread
  - RS = ISO/BSP parallel pipe thread
  - RT = ISO/BSP tapered pipe thread
  - ST = Straight thread with O-ring (for SAE/MS)
  - W = Male pipe weld/tube socket weld

### Tees and Crosses

Ordering numbers for tees and crosses indicate first the size of the run (1 to 2) and then the size of the branch (3 for tees and 3 to 4 for crosses).

Example: SS-6M0-3-4TTF for a 316 SS female tee for 6 mm tube with 1/4 in. female NPT branch



### Additional Sizes and Materials

Contact your authorized Swagelok representative for information about additional sizes and special alloys.



## Additional Ordering Information

Swagelok tube adapter ordering numbers follow the sequence shown below.

**A** - **B** - **C** - **D** - **E** **F**  
**SS** - **2** - **TA** - **1** - **4** **RT**

### **A** Material

**A** = Aluminum  
**B** = Brass  
**C20** = Alloy 20  
**HC** = Alloy C-276  
**INC** = Alloy 600  
**M** = Alloy 400  
**NY** = Nylon  
**S** = Carbon steel  
**SS** = 316 stainless steel  
**T** = PTFE  
**TI** = Titanium  
**625** = Alloy 625  
**825** = Alloy 825

### **B** Size (Tube OD)

Fractional, in.	Metric, mm
1 = 1/16	2 = 2
2 = 1/8	3 = 3
3 = 3/16	4 = 4
4 = 1/4	6 = 6
5 = 5/16	8 = 8
6 = 3/8	10 = 10
8 = 1/2	12 = 12
10 = 5/8	14 = 14
12 = 3/4	15 = 15
14 = 7/8	16 = 16
16 = 1	18 = 18
18 = 1 1/8	20 = 20
20 = 1 1/4	22 = 22
24 = 1 1/2	25 = 25
32 = 2	28 = 28
	32 = 32
	38 = 38
	50 = 50

### **C** Component

**TA** = Fractional tube adapter  
**MTA** = Metric tube adapter

### **D** Adapter Type

**1** = Male adapter  
**7** = Female adapter

### **E** Second End Connection Size

Add a size designator from the list at left for the second end connection.

### **F** Second End Connection Type

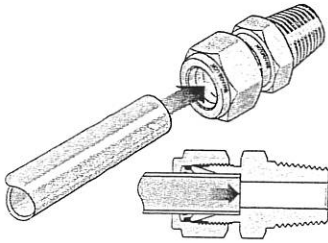
Add a second end connection type designator as needed.

**AN** = 37° male AN flare  
**ANF** = 37° female AN flare  
**RG** = ISO/BSP parallel pipe thread (gauge)  
**RJ** = ISO/BSP parallel pipe thread (Japanese gauge)  
**RP** = ISO/BSP parallel pipe thread  
**RS** = ISO/BSP parallel pipe thread  
**RT** = ISO/BSP tapered pipe thread  
**ST** = Straight thread with O-ring (for SAE/MS)  
**W** = Male pipe weld/tube socket weld

## Installation Instructions

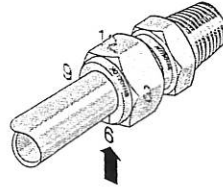
### Swagelok Tube Fittings Up to 1 in./25 mm

These instructions apply both to traditional fittings and to fittings with the advanced back-ferrule geometry.

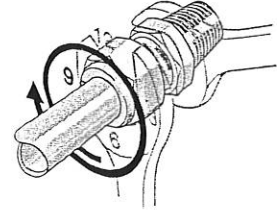


Fully insert the tube into the fitting and against the shoulder; rotate the nut finger-tight.

**High-pressure applications and high safety-factor systems:** Further tighten the nut until the tube will not turn by hand or move axially in the fitting.



Mark the nut at the 6 o'clock position.



While holding the fitting body steady, tighten the nut one and one-quarter turns to the 9 o'clock position.

For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut only three-quarters turn to the 3 o'clock position.

### Swagelok Tube Fittings Over 1 in./25 mm

1. Preswage the ferrules onto the tube using a Swagelok multihead hydraulic swaging unit (MHSU).
2. Apply the lubricant packaged with the fitting lightly to the body threads and the rear surface of the back ferrule.
3. Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body; rotate the nut finger-tight.
4. Mark the nut at the 6 o'clock position.

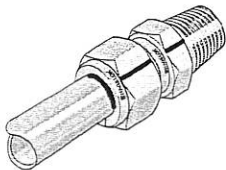
5. While holding the fitting body steady, tighten the nut one-half turn to the 12 o'clock position.

Use the Swagelok MHSU gap inspection gauge to ensure that the fitting has been tightened sufficiently.

### Reassembly—All Sizes

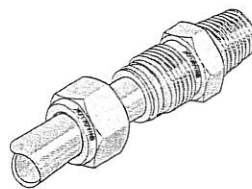
You may disassemble and reassemble Swagelok tube fittings many times.

**⚠ Always depressurize the system before disassembling a Swagelok tube fitting.**



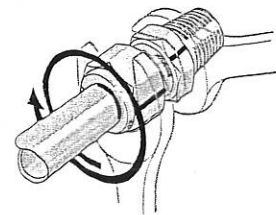
Prior to disassembly, mark the tube at the back of the nut; mark a line along the nut and fitting body flats.

Use these marks to ensure that you return the nut to the previously pulled-up position.



Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body.

**Over 1 in./25 mm sizes:** If needed, reapply lubricant lightly to the body threads and the rear surface of the back ferrule.



While holding the fitting body steady, rotate the nut with a wrench to the previously pulled-up position, as indicated by the marks on the tube and flats. At this point, you will feel a significant increase in resistance. Tighten the nut slightly.

**⚠ Do not use the Swagelok gap inspection gauge with reassembled fittings.**

### O-Seal Male Connectors

1. Turn the O-seal connector into the female end until it is finger-tight.
2. Tighten the O-seal connector until it makes metal-to-metal contact with the face of the female end.
3. Tighten slightly with a wrench.

## Installation Instructions

### Caps and Plugs



#### Caps

See Swagelok tube fitting installation and reassembly, page 63.



#### Plugs

While holding fitting body steady, tighten the plug one-quarter turn from the finger-tight position.

*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the plug one-eighth turn.*  
*For over 1 in./25 mm tube fittings, tighten the plug one-quarter turn.*

#### Reassembly

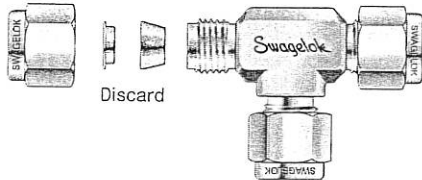
You may disassemble and reassemble Swagelok plugs many times. Make subsequent connections by slightly tightening with a wrench after snugging the nut by hand.

### Port Connectors

Connect the machined ferrule end **before** connecting the tube adapter end.

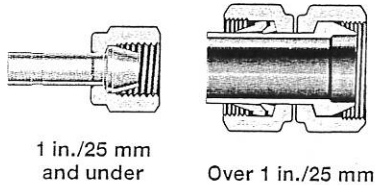
#### Machined Ferrule End

1. Remove the nut and ferrules from the Swagelok end connection. Discard the ferrules.

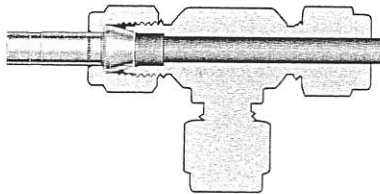


2. Slip the nut over the machined ferrule end of the port connector.

*Over 1 in./25 mm sizes: The nut is preassembled on the port connector.*

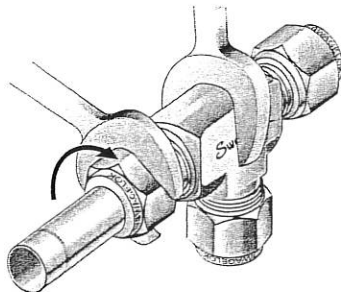


3. Insert the port connector into the end connection and finger-tighten the nut.



4. While holding fitting body steady, tighten the nut one-quarter turn.

*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut one-eighth turn.*



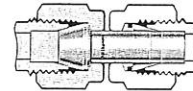
- ⚠ **Do not use the Swagelok gap inspection gauge with machined ferrule ends.**

#### Reassembly

You may disassemble and reassemble Swagelok port connectors many times. Make subsequent connections by slightly tightening with a wrench after snugging the nut by hand.

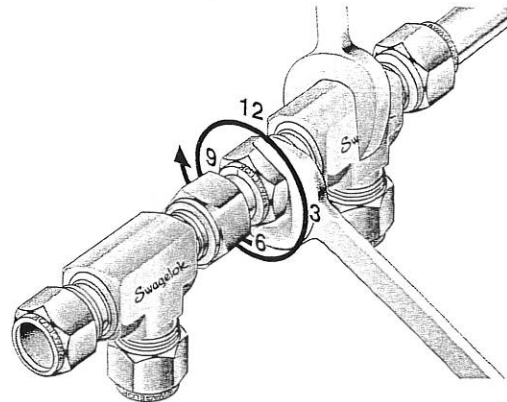
#### Tube Adapter End

5. Insert the tube adapter until it rests firmly on the shoulder of the Swagelok tube fitting body. Finger-tighten the nut.



*Over 1 in./25 mm sizes: Remove and discard the nut and ferrules from the end connection, then insert the tube adapter.*

6. Mark the nut at the 6 o'clock position. While holding fitting body steady, tighten the nut one and one-quarter turns to the 9 o'clock position.



*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut three-quarters turn to the 3 o'clock position.*

*For preswaged over 1 in./25 mm and over tube fittings, tighten the nut one-half turn to the 12 o'clock position.*

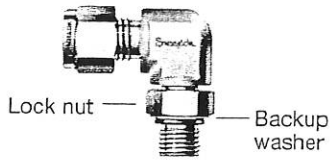
- ⚠ **Do not use the Swagelok gap inspection gauge with preswaged tube adapter connections over 1 in./25 mm.**

#### Reassembly

See Swagelok tube fitting reassembly, page 63.

## Installation Instructions

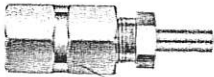
### Positionable Elbows and Tees



1. Turn the positionable end into the female fitting until the metal backup washer contacts the face of the fitting.
2. Turn the positionable end out of the female fitting (not more than one turn) until the Swagelok tube fitting end is positioned properly.
3. While holding fitting body steady, tighten the lock nut until the metal backup washer contacts the face of the fitting.

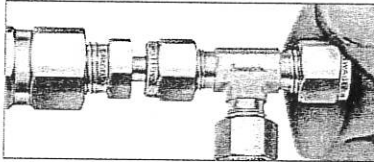
### Tube Adapters

Fig. 1



Female pipe port  
on existing equipment

Fig. 2



#### Up to 1 in./25 mm

1. Install the end opposite the tube adapter end (Fig. 1).
2. Insert the tube adapter into the Swagelok tube fitting. Make sure that the tube adapter rests firmly on the shoulder of the tube fitting body and that the nut is finger-tight (Fig. 2).
3. Mark the nut at the 6 o'clock position.
4. While holding fitting body steady, tighten the nut one and one-quarter turns to the 9 o'clock position.

*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut only three-quarters turn to the 3 o'clock position.*

#### Over 1 in./25 mm

Swagelok tube adapters over 1 in./25 mm are furnished with nuts and preswaged ferrules.

To assemble, follow steps 2 through 5 of the Swagelok tube fittings over 1 in./25 mm assembly instructions, page 63.

**⚠ Do not use the Swagelok gap inspection gauge with preswaged tube adapter connections over 1 in./25 mm.**

#### Reassembly

See Swagelok tube fitting reassembly, page 63.

## Weld Fittings

### Welding Precautions for Swagelok Tube Fittings with Weld End Connections

1. Remove the nut and ferrules.
2. Turn a Swagelok tube fitting plug or another nut onto the fitting so that it is finger-tight. This protects the threads and sealing components.
3. Provide a suitable heat sink to dissipate the heat.
4. Tack weld at four positions 90° apart to hold the fitting in place and to ensure alignment and concentricity of the components.
5. Complete the weld.
6. Remove the plug or nut and replace the nut and ferrules.

**⚠ Caution: When welding carbon steel fittings, the heat often removes the protective oil from the threads. It is important to apply another lubricant, such as Goop™ thread lubricant.**

## Depth Marking Tool

Fig. 1



Fig. 2



1. Insert cleanly cut, fully deburred tube into the depth marking tool (DMT) until the tube is against the shoulder of the tool. Using a pen or pencil, mark the tube at the top of the DMT (Fig. 1).
2. Remove the tube from the DMT and insert it into the Swagelok fitting until it is against the shoulder

of the fitting body (Fig. 2). Rotate the nut finger-tight. If any portion of the mark on the tube can be seen above the fitting nut, the tube is not fully inserted into the fitting.

3. While holding the fitting body steady, follow Swagelok tube fitting installation instructions, page 63.

## Installation Instructions

### Preswaging Tool

Fig. 1

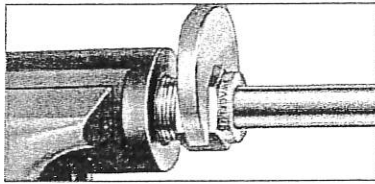


Fig. 2

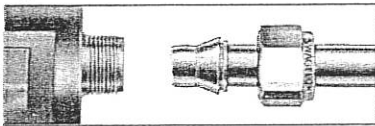
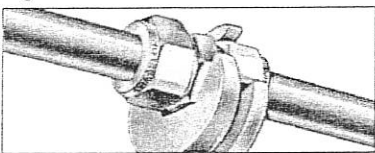
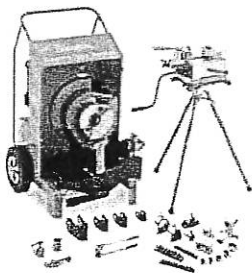


Fig. 3



1. Install the Swagelok nut and ferrules onto the preswaging tool.
2. Insert the tube into the preswaging tool.
3. Make sure that the tube rests firmly on the shoulder of the preswaging tool body and that the nut is finger-tight.
4. Mark the nut at the 6 o'clock position.
5. While holding the preswaging tool steady, tighten the nut one and one-quarter turns to the 9 o'clock position.  
*For 1/16, 1/8, and 3/16 in.; 2, 3, and 4 mm tube fittings, tighten the nut only three-quarters turn to the 3 o'clock position (Fig. 1).*
6. Loosen the nut.
7. Remove the tube with preswaged ferrules from the preswaging tool. If the tube sticks in the preswaging tool, remove the tube by gently rocking it back and forth. Do not turn the tube (Fig. 2).
8. Insert the tube with preswaged ferrules into the fitting until the front ferrule seats against the fitting body.
9. While holding the fitting body steady, rotate the nut with a wrench to the previously pulled-up position; at this point, you will feel a significant increase in resistance.
10. Tighten the nut slightly (Fig. 3).

⚠ Do not use the Swagelok gap inspection gauge with fittings that were assembled using the preswaging tool.



### Tubing Tools and Accessories

For tube benders, tube preparation tools, and tube support systems, see the Swagelok *Tubing Tools and Accessories* catalog, MS-01-179.

### Leak Detectors, Lubricants, and Sealants

For liquid leak detectors, lubricants, and sealants, see the Swagelok *Leak Detectors, Lubricants, and Sealants* catalog, MS-01-91.

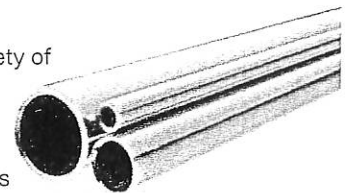


### Tubing Products

Swagelok offers a wide variety of tubing products.

Contact your authorized Swagelok representative or see these Swagelok catalogs for more information:

- *Stainless Steel Seamless Tubing, Fractional Sizes*, MS-01-153-SCS
- *Stainless Steel Tubing, Metric Sizes*, MS-01-157-SCS
- *Stainless Steel Tubing, Imperial Sizes*, MS-01-159-SCS



### Safe Product Selection

When selecting a product, the total system design must be considered to ensure safe, trouble-free performance. Function, material compatibility, adequate ratings, proper installation, operation, and maintenance are the responsibilities of the system designer and user.

**Caution:** Do not mix or interchange parts with those of other manufacturers.

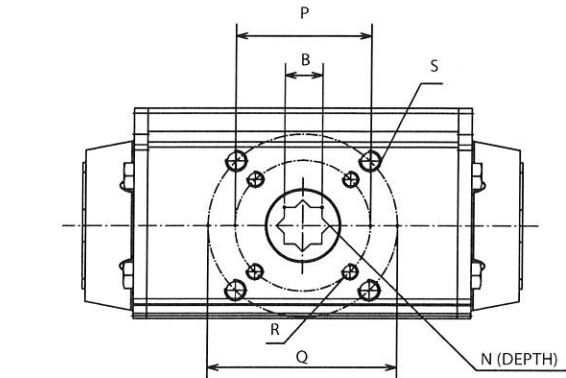
### Warranty Information

Swagelok products are backed by The Swagelok Limited Lifetime Warranty. For a copy, visit [swagelok.com](http://swagelok.com) or contact your authorized Swagelok representative.

Swagelok, Hinging-Colleting, VCR, VCO, Snoop, Goop, SWAK, Ferrule-Pak—TM Swagelok Company  
Krytox—TM DuPont  
SAF 2507—TM Sandvik AB  
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Printed in U.S.A., AGS  
September 2011, R14  
MS-01-140

# BI-TORQ PN-SERIES DIMENSIONAL DATA

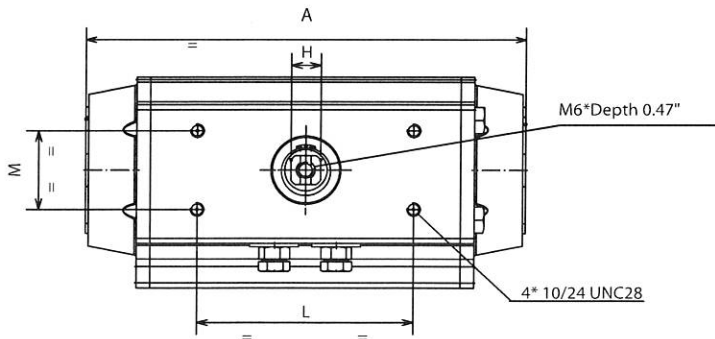
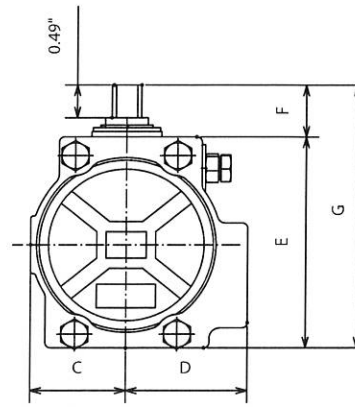
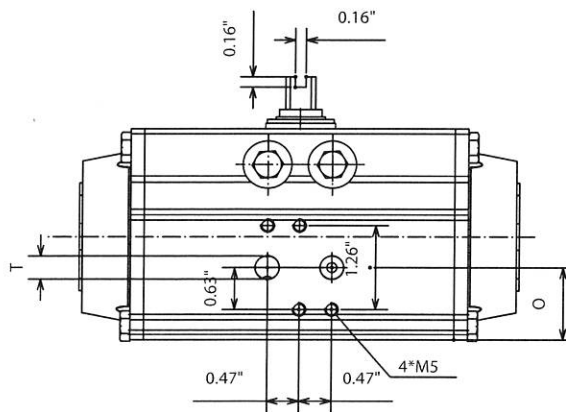
FOR ACTUATOR MODELS 52 THROUGH 140



**BI-TORQ**  
VALVE AUTOMATION



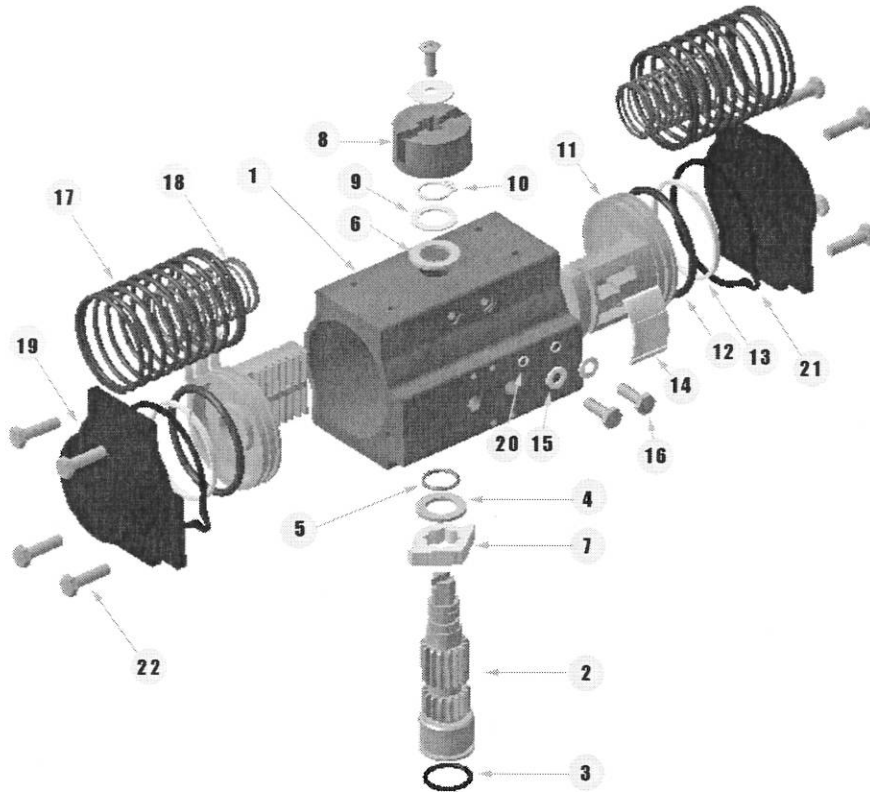
**AVK CARBO-BOND, INC.**  
AUTOMATED VALVE MOUNTING KITS



## DIMENSIONAL DATA

	ISO 5211	A	B	C	D	E	F	G	H	K	L	M	N	O	P	Q	R (UNC)	S (UNC)	T (NPT)
PN-52	F03/F05	5.49	0.433	1.18	1.61	2.74	0.787	3.52	0.43	0.47	3.15	1.18	0.47	1.04	1.42	1.97	10-24 X 0.29	1/4-20 X 0.35	1/8"
PN-63	F05/F07	6.38	0.551	1.40	1.77	3.17	0.787	3.96	0.43	0.59	3.15	1.18	0.63	1.08	1.97	2.76	1/4-20 X 0.31	5/16-18 X 0.47	1/8"
PN-75	F05/F07	8.15	0.669	1.65	2.07	3.82	0.787	4.61	0.67	0.75	3.15	1.18	0.75	1.38	1.97	2.76	1/4-20 X 0.31	5/16-18 X 0.47	1/8"
PN-85	F05/F07	9.35	0.669	1.87	2.30	4.27	0.787	5.06	0.67	0.87	3.15	1.18	0.75	1.65	1.97	2.76	1/4-20 X 0.31	5/16-18 X 0.47	1/8"
PN-100	F07/F10	10.69	0.669	2.17	2.68	4.78	0.787	5.57	0.67	0.87	3.15	1.18	0.81	1.97	2.76	4.02	5/16-18 x 0.47	3/8-16 x 0.55	1/4"
PN-115	F07/F10	12.91	0.869	2.52	2.87	5.57	1.180	6.75	1.06	1.26	5.12	1.18	0.94	1.97	2.76	4.02	5/16-18 x 0.47	3/8-16 x 0.59	1/4"
PN-125	F07/F10	14.41	0.869	2.68	3.15	6.04	1.180	7.22	1.06	1.26	5.12	1.18	0.94	2.40	2.76	4.02	5/16-18 x 0.47	3/8-16 x 0.59	1/4"
PN-140	F10/F12	16.85	1.060	3.01	3.44	6.93	1.180	8.11	1.06	1.38	5.12	1.18	1.14	2.80	4.02	4.92	3/8-16 x 0.59	1/2-13 x 0.71	1/4"

# PARTS BREAKDOWN FOR PN-52 THROUGH PN-140



PART NUMBER	DESCRIPTION	MATERIAL	TREATMENT	OPTIONAL MATERIAL	QTY. (DA)	QTY. (SR)
1	BODY	EXTRUDED ALUMINUM	HARD ANODIZED	STAINLESS	1	1
2	ANTI-BLOWOUT PINION	STEEL	NICKEL PLATED	STAINLESS	1	1
3	LOWER PINION O-RING*	NBR70	---	VITON	1	1
4	PINION SPACER RING	PTFE+15% GRAPHITE	---		1	1
5	TOP PINION O-RING	NBR70	---	VITON	1	1
6	CAM SPACER RING*	PTFE+15% GRAPHITE	---		1	1
7	STOP ADJUSTMENT	STAINLESS STEEL	---		1	1
8	POSITION INDICATOR	NYLON	---		1	1
9	PINION WASHER	STAINLESS STEEL	---		1	1
10	PINION SNAP RING	STEEL	NICKEL PLATED		1	1
11	PISTON	DIE CAST ALUMINUM	---		2	2
12	PISTON O-RING*	NBR70	---	VITON	2	2
13	ANTI-FRICTION RING*	PTFE+15% GRAPHITE	---		2	2
14	PISTON THRUST BLOCK	PTFE+15% GRAPHITE	---		2	2
15	STOP BOLT WASHER	STAINLESS STEEL	---		2	2
16	STOP BOLT	STAINLESS STEEL	---		2	2
17	EXTERNAL SPRING	STEEL	ZINC PHOSPHATE COATED		N/A	SEE SPRING CHART
18	INTERNAL SPRING	STEEL	ZINC PHOSPHATE COATED		N/A	SEE SPRING CHART
19	END CAP	DIE CAST ALUMINUM	EPOXY COATED	STAINLESS	1	1
20	STOP WASHER					
21	END CAP SEALS	NBR70	---	VITON	8	8
22	END CAP BOLTS	STAINLESS STEEL	---		8	8

\*Parts subject to wear

# BI-TORQ® DOUBLE ACTING ACTUATOR SIZING

## AVAILABLE AIR SUPPLY PRESSURE (PSI)

MODEL	40PSI	50PSI	60PSI	70PSI	80PSI	90PSI	100PSI	115PSI
BI-32DA	34	43	55	64	71	82	87	101
BI-52DA	86	110	133	156	179	203	226	261
BI-63DA	154	196	238	280	321	363	405	468
BI-75DA	284	360	435	511	586	661	737	850
BI-85DA	408	518	629	740	851	962	1072	1238
BI-100DA	646	818	991	1163	1336	1508	1681	1939
BI-115DA	1070	1355	1640	1925	2210	2495	2780	3208
BI-125DA	1409	1783	2157	2532	2906	3280	3654	4216
BI-140DA	2009	2511	3013	3515	4018	4513	5015	5772
BI-160DA	2930	3662	4394	5127	5859	6591	7324	8422
BI-200DA	5488	6866	8239	9612	10981	12359	13732	15792
BI-270DA	12734	15919	19097	22284	25469	28654	31832	36661

ACTUATOR TORQUE OUTPUT (IN. LBS.)

FOR TORQUE VALUES OR AIR SUPPLY PRESSURES NOT LISTED, PLEASE CONSULT FACTORY

## TECHNICAL DATA

### ACTUATOR WEIGHTS (LBS.)

MODEL	32	52	63	75	85	100	115	125	140	160	200	270
DOUBLE ACTING	1.08	2.25	3.26	5.51	7.39	11.02	17.75	22.09	33.86	43.21	70.99	154.00
SPRING RETURN	---	2.62	3.97	6.94	9.37	14.40	23.92	26.76	45.28	65.04	111.00	192.79

### ACTUATOR CYCLE TIME (SECONDS)

MODEL	32	52	63	75	85	100	115	125	140	160	200	270
CCW (DA)	0.03	0.03	0.06	0.12	0.20	0.30	0.53	0.83	0.98	1.15	1.74	4.50
CW (DA)	0.03	0.04	0.08	0.12	0.19	0.27	0.47	0.66	0.93	1.10	1.70	4.50
CCW (SR)	---	0.09	0.14	0.22	0.31	0.44	0.83	1.08	1.23	1.75	2.38	4.50
CW (SR)	---	0.09	0.14	0.22	0.33	0.46	0.78	0.90	0.97	1.34	2.19	6.20

NOTE: ALL CYCLE TIMES ARE DERIVED INDEPENDENTLY OF VALVES AND ACTUATOR ACCESSORIES THAT MIGHT AFFECT OVERALL TIME PERFORMANCE.  
CYCLE TIMES ARE BASED ON 80 PSI AIR SUPPLY.

### ACTUATOR AIR CONSUMPTION (CUBIC INCHES)

MODEL	32	52	63	75	85	100	115	125	140	160	200	270
CCW (DA & SR)	2.318	6.590	12.143	16.232	30.206	45.340	61.023	106.852	137.91	220.052	348.080	915.359
CW (DA)	1.708	9.336	17.208	20.504	39.534	66.760	103.740	148.471	192.84	290.596	599.743	1086.226
CW (SR)	---	7.689	14.218	17.147	32.403	54.372	85.433	122.047	146.46	215.109	462.563	945.871





# Finite's High Pressure J-Series Filters

## HIGH PRESSURE SYSTEMS NEED FILTRATION PROTECTION

High pressure compressed gas systems pose difficult problems that require special filtration attention. Excessive amounts of liquid aerosols and solid particulate contamination are common. In addition, higher temperature levels are possible and may cause the liquid oils to varnish.

Varnishing contributes to poor component performance and wear that may lead to unscheduled maintenance. Finite's J Series high pressure filters are an extremely effective way to reduce or eliminate those problems.

## REMOVING LIQUID AEROSOLS

Finite's Grade 4 media will remove 99.995% of liquid aerosols in the .3 to .6 micron range. For most systems the Grade 4 coalescing media is recommended. But for systems with high liquid concentration (+50 ppm of oil or +25 ppm of water), precoalescing is required.

Precoalescing involves two stage filtration. A Finite J Series filter with grade 10 media is used to remove gross aerosols. Then a second J Series filter with Grade 4 media is placed after the grade 10 filter to clean up the remaining aerosols.

## FILTERING SOLID PARTICULATES

Particulate contamination problems are controlled and often eliminated with Finite's 3P pleated cellulose media. The pleated element exposes a larger surface area that significantly increases filter life.

Particulate filter elements like the 3P are often used upstream of coalescing filters. By first removing particulate contamination, such as pipe scale, rust and dirt first, the life of the coalescing filter is greatly extended.

Compressed Gas  
CNG/Alt. Fuels

## COMPRESSED NATURAL GAS SOLUTIONS

- Robust filter element construction
- Threaded head to bowl design
- Temperatures to 350°F
- Available in SAE and NPT connections
- Pressures to 5000 PSIG

High-efficiency coalescing filters upstream of the CNG dispenser protect sensitive vehicle components from damage occurring when the solid contaminants, water and oil are generated with the gas delivery system.

## Typical Applications

### *Coalescing (Oil Removal)*

- Dryer protection
- Breathing air
- Compressed air system protection

### *Interceptor (Particulate Removal)*

- Desiccant dryer afterfilter
- Prefilter for coalescer
- Systems with high particulate concentration
- Particulate protection for non-lubricated systems

### *Adsorber (Vapor Removal)*

- Odor removal
- High purity laboratory gases
- Last trace oil vapors/hydrocarbon

# Specifications



At high pressures, excessive amounts of oil aerosols may be present. Precoalescing with Grade 10 may be necessary before final coalescing.



Grade 4 (not Grade 6 as in other Finite filter series) is used as the standard coalescer media in the J Series. High pressure systems reduce the effectiveness of filter media, requiring the upgrade to Grade 4 as the standard.



Flow direction:  
Coalescers (Grade 10 or 4)  
Interceptors ("3P" Particulate)  
Adsorbers ("A" Charcoal adsorber)

Replacement Elements:



Coalescing filters and particulate interceptors should be replaced a minimum of one time per year with a maximum 10 psid pressure drop. Adsorber elements should be replaced every six months, or as necessary. For example, in a breathing air application, adsorbers should be replaced when hydrocarbon vapor is detected as an odor.



Mount these filters in a vertical position.



Do not service these filters under pressure! The system pressure must be reduced to atmospheric levels before changing elements, draining bowls, or performing any other maintenance activity on or near these filters.

Compressed Gas  
CNG/Alt. Fuels

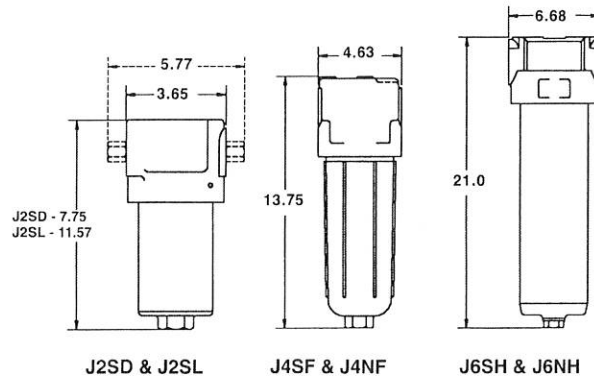
Port 1 to Port 2 (in to out)  
Port 2 to Port 1 (out to in)  
Port 2 to Port 1 (out to in)

Housing Model	J2SD	J2SL	J4SF	J4NF	J6SH	J6NH
Port Size	SAE-8 (Std) Adaptor Busings Provided for 1/2" NPT Female		SAE-16	1" NPT	SAE-24	1 1/2" NPT
Pressure (PSIG) Max.	5000		5000		5000	
Temperature (°F), Max	350°		350°		350°	
Sump Capacity (ml)	60ml	220ml	210 ml		637 ml	
Assembly Weight (lbs)	9.2	13.1	22.1		52.5	
Major Materials of Construction (with coalescing element installed)	Ductile iron, fluorocarbon seals, aluminum, fiberglass, carbon steel, epoxy, rayon		Nodular cast iron, carbon steel, fluorocarbon seals, fiberglass, epoxy, rayon, aluminum and engineered plastic		Nodular cast iron, carbon steel, fluorocarbon seals, fiberglass, epoxy, rayon, and aluminum	
Drain Port Size	SAE-6		SAE-6		SAE-6	

## Flow Rates (SCFM @ indicated system pressures)

	Media	J2SD & J2SL	J4SF & J4NF	J6SH & J6NH
Flow @ 100 PSIG	4C, A	30	75	225
	10C, 3P	60	150	450
Flow @ 1500 PSIG	4C, A	400	1000	3000
	10C, 3P	800	2000	6000
Flow @ 3000 PSIG	4C, A	800	2000	6000
	10C, 3P	1600	4000	12000
Flow @ 4500 PSIG	4C, A	1200	3000	9000
	10C, 3P	2400	6000	18000

# Dimensions (In Inches)



Compressed Gas  
CNG/Alt. Fuels

## How to Order

Use the steps below to build your own part number. The J-Series How to Order is broken into three connection sizes. First choose your connection size, then build your part number. For any permutation not mentioned below, please consult factory at 1-800-521-4357.

For a 1/2" connection size																				
<b>J</b>	<b>2</b>	<b>S</b>	<b>D</b>	<b>10C</b>	<b>WC</b>	<b>11-035</b>														
Series	Connection	Bowl Thread	Media Bowl	Media Type	Element Construction	Element Size														
J	2 = 1/2"	S (SAE)	D (Standard) L (Long)	<table border="1"> <tr><td>4C</td><td>WC</td></tr> <tr><td>10C</td><td>WC</td></tr> <tr><td>3P</td><td>WC</td></tr> <tr><td>A</td><td>WC</td></tr> <tr><td>100</td><td>WS</td></tr> </table>	4C	WC	10C	WC	3P	WC	A	WC	100	WS		11-035				
4C	WC																			
10C	WC																			
3P	WC																			
A	WC																			
100	WS																			
For a 1" connection size																				
<b>J</b>	<b>4</b>	<b>N</b>	<b>F</b>	<b>3P</b>	<b>WC</b>	<b>15-070</b>														
Series	Connection	Bowl Thread	Media Bowl	Media Type	Element Construction	Element Size														
J	4 = 1"	S (SAE) N (NPT)	F (Standard)	<table border="1"> <tr><td>4C</td><td>WC</td></tr> <tr><td>10C</td><td>WC</td></tr> <tr><td>3P</td><td>WC</td></tr> <tr><td>A</td><td>WC</td></tr> <tr><td>100</td><td>WS</td></tr> <tr><td>10J</td><td>WM</td></tr> <tr><td>10J</td><td>WA</td></tr> </table>	4C	WC	10C	WC	3P	WC	A	WC	100	WS	10J	WM	10J	WA		15-070
4C	WC																			
10C	WC																			
3P	WC																			
A	WC																			
100	WS																			
10J	WM																			
10J	WA																			
For a 1 1/2" connection size																				
<b>J</b>	<b>6</b>	<b>S</b>	<b>H</b>	<b>10J</b>	<b>WM</b>	<b>23-130</b>														
Series	Connection	Bowl Thread	Media Bowl	Media Type	Element Construction	Element Size														
J	6 = 1 1/2"	S (SAE) N (NPT)	H (Standard)	<table border="1"> <tr><td>4C</td><td>WC</td></tr> <tr><td>10C</td><td>WC</td></tr> <tr><td>3P</td><td>WC</td></tr> <tr><td>A</td><td>WC</td></tr> <tr><td>100</td><td>WS</td></tr> <tr><td>10J</td><td>WM</td></tr> <tr><td>10J</td><td>WA</td></tr> </table>	4C	WC	10C	WC	3P	WC	A	WC	100	WS	10J	WM	10J	WA		23-130
4C	WC																			
10C	WC																			
3P	WC																			
A	WC																			
100	WS																			
10J	WM																			
10J	WA																			

### Application Notes:

For Media Types:  
 4C (coalescer) = 99.995% efficiency  
 10C (coalescer) = 95% efficiency  
 3P = 3 micron particulate filter  
 A = Hydrocarbon vapor removal  
 100WS = 100 micron liquid removal  
 10JWM = desiccant dryer with molecular sieve  
 10JWA = desiccant dryer with activated aluminum

Element Construction:  
 WC = Metal retainers, bonded on end caps with positive O-ring seal.

Replacement Elements:  
 Start with the whole part number, but for the replacement element, drop the series name, thread connection and thread type. For example if you started with a J2SD-4CWC15-070, and you needed a replacement element, the element part number would be 4CWC15-070.

Examples (Housing and Element): J2SD-10CWC11-035  
 J4NF-3PWC15-070  
 J6SH-10JWM23-130

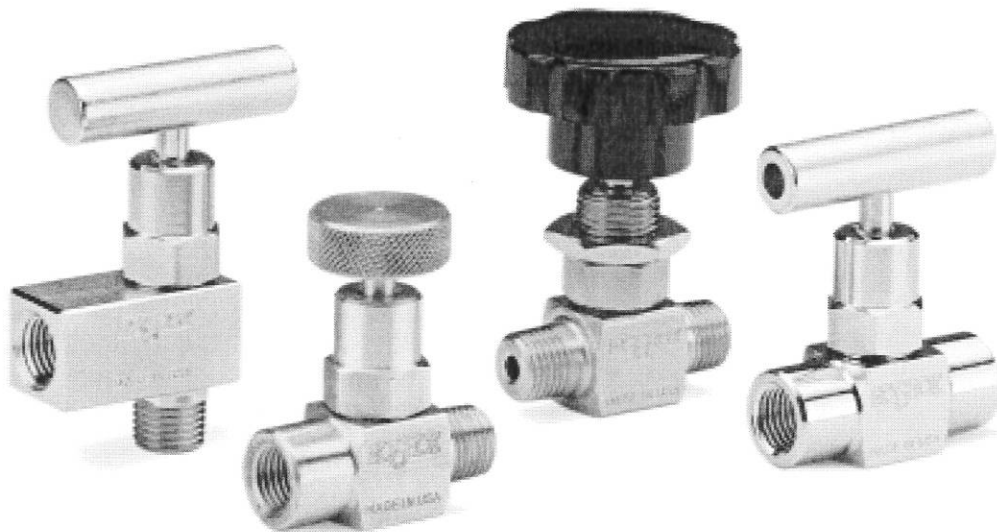
Replacement Elements: 10CWC11-035  
 3PWC15-070  
 10JWM23-130





100 SERIES

# mini VALVES



The **New NOSHOK 100 Series Mini Valve** is a big valve in a little package. Available in electroless nickel plated steel, electropolished stainless steel and brass, the **Mini Valve** was designed with your toughest applications in mind. All are equipped with both a Viton® O-Ring seal and a Teflon® back-up ring below the stem threads to protect the **Mini Valve** from corrosion and galling. The stem threads are rolled for strength and ease of operation, and the metal-to-metal hard seat design is *100% Helium leak tested* to  $1 \times 10^{-4}$  ml/s at 200 psi on each **Mini Valve**.

At a maximum pressure rating of 6000 psi for the Stainless Steel and Steel models and a 3000 psi rating for the Brass models, the **NOSHOK Mini Valve** has much to offer for such a little valve. With a variety of optional handles to choose from and the panel mount option, the **Mini Valve** will fit perfectly into any application.

## Ordering Information

PART NUMBER	CONNECTION	MATERIAL
101 MMB	1/8 NPT Male-Male	Brass
102 MMB	1/4 NPT Male-Male	Brass
101 MMC	1/8 NPT Male-Male	Steel
102 MMC	1/4 NPT Male-Male	Steel
101 MMS	1/8 NPT Male-Male	Stainless Steel
102 MMS	1/4 NPT Male-Male	Stainless Steel
101 MFB	1/8 NPT Male-Female	Brass
102 MFB	1/4 NPT Male-Female	Brass
101 MFC	1/8 NPT Male-Female	Steel
102 MFC	1/4 NPT Male-Female	Steel
101 MFS	1/8 NPT Male-Female	Stainless Steel
102 MFS	1/4 NPT Male-Female	Stainless Steel
101 FFB	1/8 NPT Female-Female	Brass
102 FFB	1/4 NPT Female-Female	Brass
101 FFC	1/8 NPT Female-Female	Steel
102 FFC	1/4 NPT Female-Female	Steel

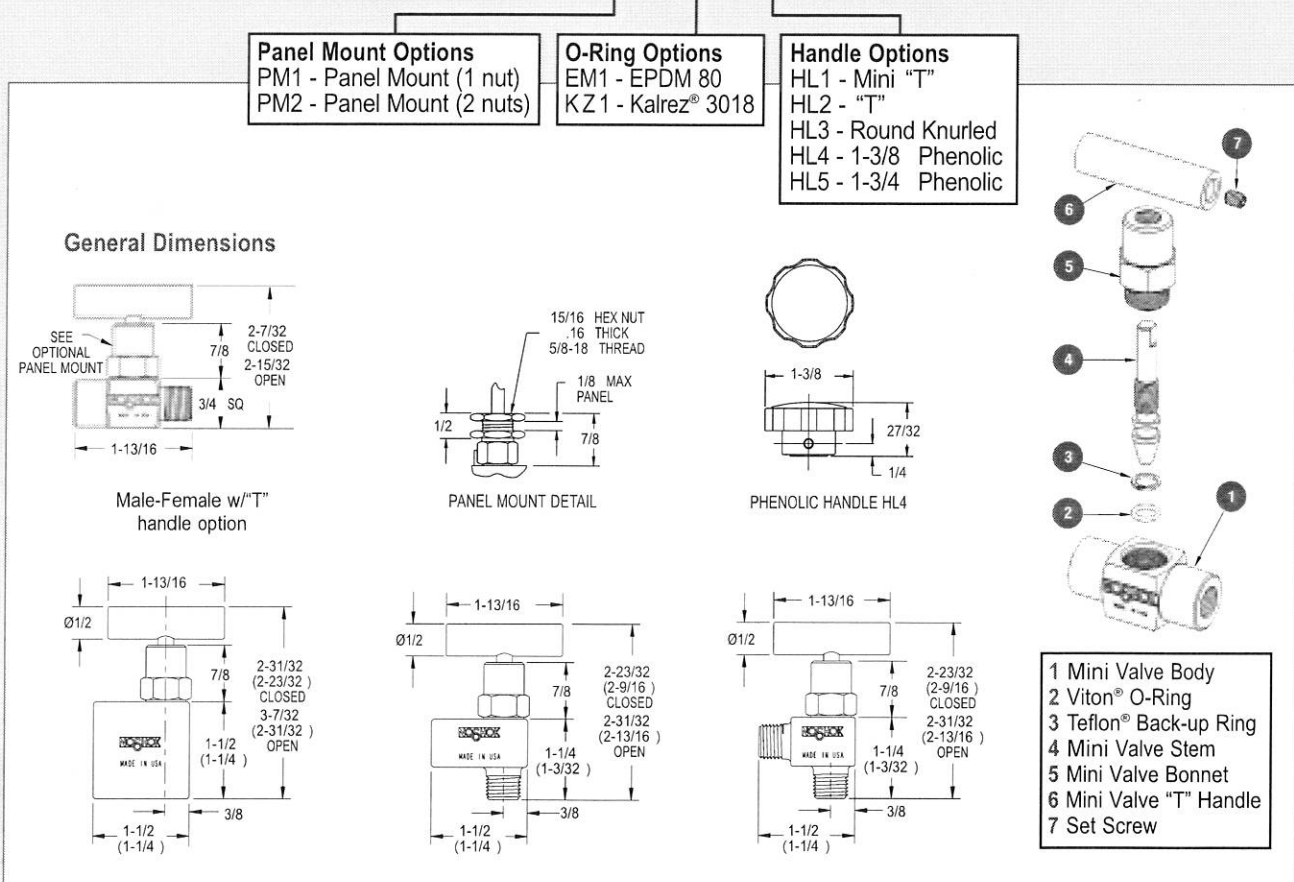
PART NUMBER	CONNECTION	MATERIAL
102 FFC	1/4 NPT Female-Female	Steel
101 FFS	1/8 NPT Female-Female	Stainless Steel
102 FFS	1/4 NPT Female-Female	Stainless Steel
101 MFAB	1/8 NPT Male-Female Angle	Brass
102 MFAB	1/4 NPT Male-Female Angle	Brass
101 MFAC	1/8 NPT Male-Female Angle	Steel
102 MFAC	1/4 NPT Male-Female Angle	Steel
101 MFAS	1/8 NPT Male-Female Angle	Stainless Steel
102 MFAS	1/4 NPT Male-Female Angle	Stainless Steel
101 FFAB	1/8 NPT Female-Female Angle	Brass
102 FFAB	1/4 NPT Female-Female Angle	Brass
101 FFAC	1/8 NPT Female-Female Angle	Steel
102 FFAC	1/4 NPT Female-Female Angle	Steel
101 FFAS	1/8 NPT Female-Female Angle	Stainless Steel
102 FFAS	1/4 NPT Female-Female Angle	Stainless Steel

When ordering options please refer to the Part Number Construction guide below for the appropriate suffix. Please note that the standard O-Ring in all the **NOSHOK Mini Valves** are Viton® and the standard handles are:

**Brass:** Round Knurled (HL3) • **Steel:** Mini "T" (HL1) • **316SS:** Mini "T" (HL1)

The handle material will always match the material of the valve, unless otherwise specified. For example, the round knurled (HL3) on a 102 FFB will be brass. When only the standard configuration is needed, no additional designations are necessary. Please consult the factory for special application requests.

Part Number Construction: **102 FFC - PM2 - EM1 - HL4**



For flow characteristics refer to page 14

Kalrez® and Viton® are registered trademarks of DuPont Dow Elastomers  
Teflon® is a registered trademark of the DuPont Company

### Technical Data:

<b>Maximum Pressure Rating:</b>	<b>Orifice size:</b>	0.172"
Steel: 6000 psi	<b>Flow Coefficient:</b>	0.42
Stainless Steel: 6000 psi	<b>Standard O-Ring:</b>	Viton®
Brass: 3000 psi	<b>Standard Back-up Ring:</b>	Teflon®



## Bourdon Tube Pressure Gauges

All Stainless Steel Construction  
Industrial Series Liquid Fillable • Type 23X.53

### Pressure Gauges

#### Application

Suitable for corrosive environments compatible with 316 stainless steel wetted parts, dry and liquid fillable case, where vibration and/or pressure pulsation occur in liquid or gaseous media which will not obstruct the pressure system.

#### Sizes (All sizes not stocked)

2", 2½" and 4" (50, 63 and 100 mm)

#### Accuracy

2", 2½" ± 1.5% of span

4" ± 1.0% of span (ASME B40.1 Grade 1A)

#### Ranges (All ranges not stocked)

Vacuum / Compound to 30"HG / 0 / 200 PSI

Pressure from 15 PSI to 15,000 PSI

or other equivalent units of pressure or vacuum

#### Working Range

2" & 2½" Steady: 3/4 of full scale value  
Fluctuating: 2/3 of full scale value  
Short time: full scale value

4" Steady: Full scale value  
Fluctuating: 0.9 x full scale value  
Short time: 1.3 x full scale value

#### Operating Temperature

Ambient: -40°F to 140°F (-40°C to 60°C) <sup>Note 1</sup>

Media: max. 212°F (+100°C)

#### Temperature Error

Additional error when temperature changes from reference temperature of 68°F (20°C) ±0.4% for every 18°F (10°C) rising or falling. Percentage of span.

### Standard Features

#### Connection

Material: 316 stainless steel

Lower mount (LM)

Center back mount (CBM) 2½"

Lower back mount (LBM) 4"

1/4" or 1/2" NPT limited to wrench flat area

#### Bourdon Tube

Material: 316 stainless steel

30"Hg (Vac) to 1000 PSI C-type - 2" & 2½"

30"Hg (Vac) to 1500 PSI C-type - 4"

1500 PSI to 15,000 PSI helical type - 2" & 2½"

2000 PSI to 15,000 PSI helical type - 4"

#### Movement

Stainless steel

#### Dial

White aluminum with black lettering. 2½" with stop pin.

#### Pointer

Black aluminum, non-adjustable

#### Case

304 stainless steel with vent plug and SS crimping ring.  
Welded case/socket connection



#### Weather Protection

Weather resistant (NEMA 3 / IP 54) - dry case

Weather tight (NEMA 4X / IP 65) - liquid-filled case

#### Standard Scale

PSI

PSI, PSI/BAR, PSI/KPA, PSI/KG/CM<sup>2</sup> (2½" CBM)

#### Window Gasket

Buna-N

#### Case Filling

232.53 - None

233.53 - Glycerine

#### Window

Polycarbonate

Acrylic (4")

#### ORDER OPTIONS (min. order may apply)

Custom dial layout

Steel zinc plated u-clamp bracket (field installable)

Stainless steel u-clamp bracket (field installable)

Pressure compensating membrane window for filled gauges

Stainless steel polished front flange (CBM or LBM only)

Stainless steel rear flange

316 SS threaded restrictor

Glycerine, silicone, or fluorolube case filling (**Type 233.53**) <sup>(Note 1)</sup>

Special connections limited to wrench flat area

Other pressure scales available:

Bar, kPa, MPa, Kg/cm<sup>2</sup> and dual scales

DIN standards

Cleaned for oxygen service

Externally adjustable red drag pointer (max. hand)

Externally adjustable red mark pointer (set pointer)

Note 1 Temperature Ranges (Liquid filled gauges)

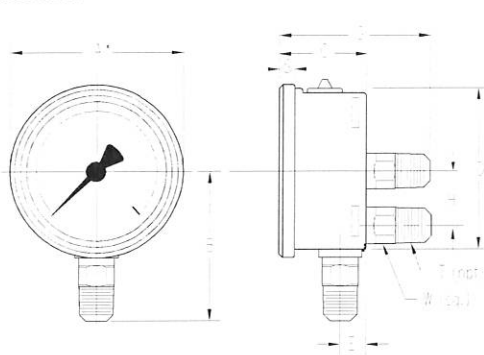
Glycerine: -4°F to 140°F (-20°C to 60°C)

Silicone: -40°F to 140°F (-40°C to 60°C)

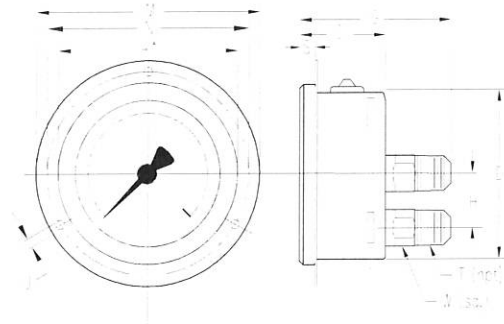
**APM 23X.53**  
**(APM 02.13)**



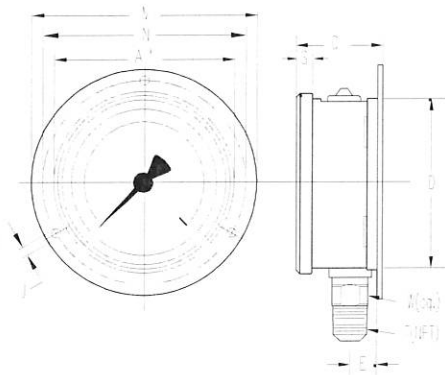
**Dimensions:**



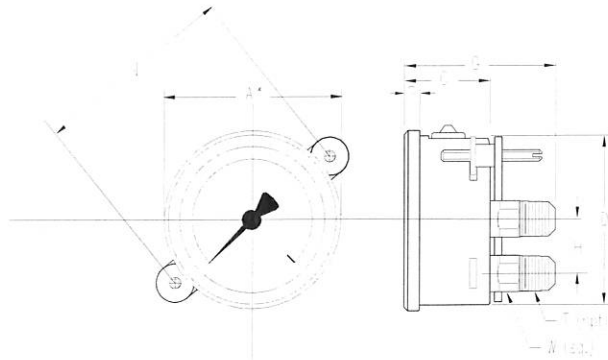
23X.53 LM, CBM/LBM



23X.53 CBM, LBM/FF



23X.53 LM/RF



23X.53 CBM, LBM/CC

A\* NOMINAL SIZE

TYPE/SIZE	WEIGHT	KEY	A*	B	C	D	E	G	H	J	L	M	N	S	T	W
23X.53 2"	0.27 lbs. + 0.06 lbs. if filled	mm	50	48	30	50	12	53	--	3.6	6.5	71	60	5.5	--	14
		in	2	1.89	1.18	1.97	0.47	2.09		0.14	0.26	2.80	2.36	0.22	1/4"	0.55
23X.53 2.5"	0.36 lbs. + 0.08 lbs. if filled	mm	63	54	32	62	13	54	--	3.6	7.5	85	75	6.5	--	14
		in	2.5	2.13	1.26	2.44	0.51	2.13		0.14	0.30	3.35	2.95	0.26	1/4"	0.55
23X.53 4"	1.10 lbs. + 0.66 lbs. if filled	mm	100	87	48	100	15.5	79.5	30	4.8	9	132	116	8	--	22
		in	4	3.43	1.89	3.94	0.61	3.13	1.18	0.19	0.35	5.20	4.57	0.31	1/2"	0.87

NOTE: For 1/4" NPT connections on 3" and 4" gauges, reduce B\* dimension by 5 mm / 0.02 in.

Panel cut-out dimensions: D + 1mm

THE MEASURE OF  
**Total Performance™**

**Ordering Information:**

State computer part number (if available) / type number / size / range / connection size and location / options required.

Specifications given in this price list represent the state of engineering at the time of printing. Modifications may take place and the specified materials may change without prior notice



**WIKAI Instrument Corporation**

1000 Wiegand Boulevard

Lawrenceville, Georgia 30043-5868

Tel: 770-513-8200 Fax: 770-338-5118

http://www.wika.com e-mail: info@wika.com

# G2 & T2 PRESSURE TRANSMITTER INSTRUCTION SHEET

# ASHCROFT®

## **⚠ WARNING! READ ⚠ BEFORE INSTALLATION**

### 1. GENERAL:

A failure resulting in injury or damage may be caused by excessive overpressure, excessive vibration or pressure pulsation, excessive instrument temperature, corrosion of the pressure containing parts, or other misuse. Consult Ashcroft Inc., Stratford, Connecticut, USA before installing if there are any questions or concerns.

### 2. OVERPRESSURE:

Pressure spikes in excess of the rated overpressure capability of the transducer may cause irreversible electrical and/or mechanical damage to the pressure measuring and containing elements.

**Fluid hammer** and surges can destroy any pressure transducer and must always be avoided. A pressure snubber should be installed to eliminate the damaging hammer effects. Fluid hammer occurs when a liquid flow is suddenly stopped, as with quick closing solenoid valves. Surges occur when flow is suddenly begun, as when a pump is turned on at full power or a valve is quickly opened.

**Liquid surges** are particularly damaging to pressure transducers if the pipe is originally empty. To avoid damaging surges, fluid lines should remain full (if possible), pumps should be brought up to power slowly, and valves opened slowly. To avoid damage from both fluid hammer and surges, a surge chamber should be installed.

Symptoms of fluid hammer and surge's damaging effects:

- Pressure transducer exhibits an output at zero pressure (large zero offset).
- Pressure transducer output remains constant regardless of pressure
- In severe cases, there will be no output.

### FREEZING:

Prohibit freezing of media in pressure port. Unit should be drained (mount in vertical position with electrical termination upward) to prevent possible overpressure damage from frozen media.

### 3. STATIC ELECTRICAL CHARGES:

Any electrical device may be susceptible to damage when exposed to static electrical charges. To avoid damage to the transducer observe the following:

- Ground the body of the transducer BEFORE making any electrical connections.
- When disconnecting, remove the ground LAST!

Note: The shield and drain wire in the cable (if supplied) is not connected to the transducer body, and is not a suitable ground.

### 4. USE IN LIFE SUPPORT DEVICES

Ashcroft Inc. products are not authorized for use as critical components in life support devices or systems without the express written approval of the General Manager, Stratford Operations of Ashcroft Inc. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

### DESCRIPTION

The Ashcroft Model G2 and T2 pressure transducers are high performance instruments intended for use in industrial applications where the process media is compatible with the 17-4PH stainless steel sensor material and the 304 SS process connection.

### MECHANICAL INSTALLATION

#### Environmental

The G2 and T2 transducers can be stored and used within the temperature limits of -40°C to 125°C (-40°F to 257°F). Ingress protection ratings of the units are dependent on the electrical termination specified. Refer to the wiring diagrams on the reverse for the IP rating of the unit which is being installed.

### Mounting

The G2 and T2 transducers require no special mounting hardware and can be mounted in any orientation with negligible position error. Although the units can withstand considerable vibration without damage or significant output effects, it is always good practice to mount the transducer where there is minimum vibration. For units with NPT type pressure fittings apply sealing tape or an equivalent sealant to the threads before installing. When installing or removing the unit apply a wrench to the hex wrench flats, located above the pressure fitting. **DO NOT** tighten by using a pipe wrench on the housing. A 27mm (1 1/4") wrench can be used on the wrench flats of the hex. For G2 models with detachable electrical connectors a 6 point deep socket can also be used to install the unit.

### Electro-Magnetic Interference

The circuitry of the G2 and T2 transducers is designed to minimize the effect of electromagnetic and radio frequency interference. To minimize susceptibility to noise, avoid running the termination wiring in a conduit which contains high current AC power cables. Where possible avoid running the termination wiring near inductive equipment.

### Field Adjustments

The G2 and T2 transducers are precisely calibrated and temperature compensated at the factory to ensure long and stable performance. There are no field accessible adjustments on the G2 or T2 transducers.

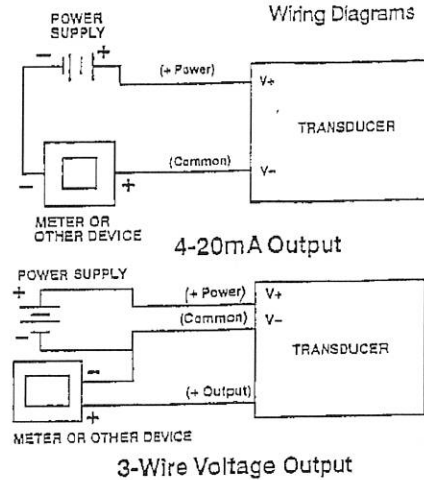
### ELECTRICAL INSTALLATION

Please refer to the reverse of this page for power supply requirements and for appropriate wiring protocol based on the particular output signal and electrical termination features of the unit being installed.

# G2 & T2 PRESSURE TRANSMITTER INSTRUCTION SHEET



## G2 & T2 ELECTRICAL INSTALLATION

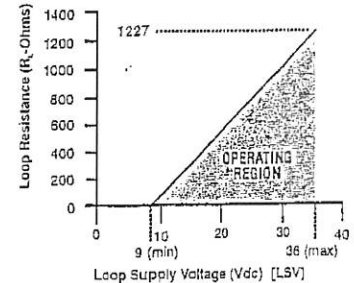


### Power Supply Requirements:

Output Signal	Min Supply	Max Supply
Ratiometric* (0.5V to 4.5V)	4.5Vdc	5.5Vdc
0-5Vdc	9Vdc	36Vdc
1-5Vdc	9Vdc	36Vdc
1-6Vdc	9Vdc	36Vdc
0-10V	14Vdc	36Vdc
4-20mA**	9Vdc	36Vdc

\*0.5Vdc-4.5Vdc output is ratiometric to the nominal 5Vdc supply  
 \*\*For transmitters with 4-20mA output signal, the minimum voltage at the terminals is 9Vdc. However, the minimum supply voltage should be calculated using the adjacent graph and formula.

### Power Supply Voltage vs Loop Resistance (4-20mA ONLY)



To determine minimum loop supply voltage:  
 $LSV_{(min)} = 9(V) + [0.022(A) \cdot R_L]$

Where:  
 LSV = Loop Supply Voltage (Vdc)  
 $R_L = R_S + R_W$  (ohms)  
 $R_L$  = Loop Resistance (ohms)  
 $R_S$  = Sense Resistance (ohms) [Measuring instrument]  
 $R_W$  = Wiring Resistance (ohms)

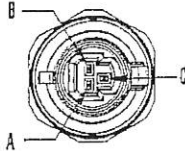
## G2 ELECTRICAL TERMINATIONS AND WIRING

### 3-PIN DELPHI (PACKARD) METRI-PACK 150 SERIES

Mates to Optional Metri-Pack connector 12065287

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
A	Common	V-	Black
B	V+	V+	Red
C	Output	V-	White

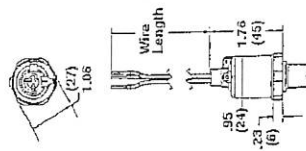
IP67 Ingress rating



### SHIELDED CABLE, PVC JACKET, 24AWG LEADS

Wire Color	Voltage Output	4-20mA Output*
Red	V+	V+
Black	Common	V-
White	Output	V-
Bare**	Shield Drain Wire	Shield Drain Wire

IP67 Ingress rating

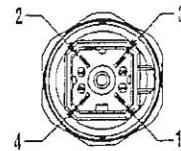


### HIRSCHMANN G SERIES

Mates to Optional Hirschmann G4W1F connector, or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V+	V+	Red
2	Common	V-	Black
3	Output	V-	White
4	Case Gnd.	Case Gnd.	Green

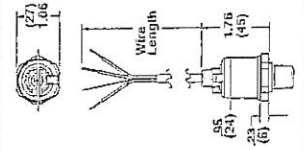
IP67 Ingress rating



### FLYING LEADS 18AWG

Wire Color	Voltage Output	4-20mA Output*
Red	V+	V+
Black	Common	V-
White	Output	V-

IP67 Ingress rating



\* Use either V- termination on G2 with 4-20mA output

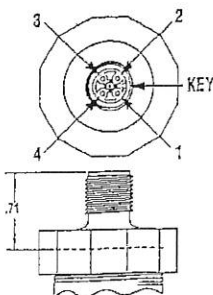
## T2 ELECTRICAL TERMINATIONS AND WIRING

### M12 ELECTRICAL TERMINATION (EW), (EO), (E2), (E1)

Mates to optional Hirschmann connector Part 993 172-100 or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V+	V+	Red
2	Output	None	White
3	Case Gnd.	Case Gnd.	Green
4	Common	Common	Black

IP65 Ingress rating

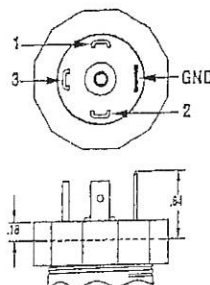


### DIN 43650-A ELECTRICAL TERMINATION (DN), (DO), (D2), (D1)

Mates to optional Hirschmann connector GDM 3009 or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V+	V+	Red
2	Common	Common	Black
3	Output	None	White
GND	Case Gnd.	Case Gnd.	Green

IP65 Ingress rating

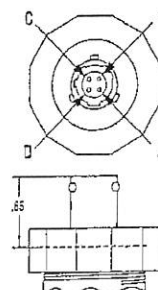


### 4-PIN BENDIX STYLE ELECTRICAL TERMINATION (B4), (H1), (L1), (P2)

Mates to optional Amphenol Bendix connector PTO6A-9-4-SR or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
A	V+	V+	Red
B	Output	None	White
C	Case Gnd.	Case Gnd.	Green
D	Common	Common	Black

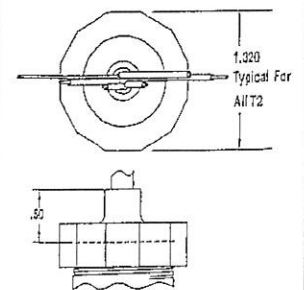
IP65 Ingress rating



### SHIELDED CABLE, PVC JACKET, 24 AWG LEADS, TERMINATION (F2), (P1)

Wire Color	Voltage Output	4-20mA Output
Red	V+	V+
White	Output	None
Black	Common	Common
Green	Case Gnd.	Case Gnd.
Bare**	Drain Wire	Drain Wire

IP65 Ingress rating



\*\* Where shielded wiring is being used; Connect the drain wire to the guard terminal on the read out device or measuring instrument if available. In all other cases connect to the ground of the power supply negative terminal.

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Note: The shield and drain wire in the cable (if supplied) is not connected to the transducer body, and is not a suitable ground.

### 4. USE IN LIFE SUPPORT DEVICES

Ashcroft Inc. products are not authorized for use as critical components in life support devices or systems without the express written approval of the General Manager, Stratford Operations of Ashcroft Inc. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

### DESCRIPTION

The Ashcroft Model G2 and T2 pressure transducers are high performance instruments intended for use in industrial applications where the process media is compatible with the 17-4PH stainless steel sensor material and the 304 SS process connection.

### MECHANICAL INSTALLATION Environmental

The G2 and T2 transducers can be stored and used within the temperature limits of -40°C to 125°C (-40°F to 257°F). Ingress protection ratings of the units are dependent on the electrical termination specified. Refer to the wiring diagrams on the reverse for the IP rating of the unit which is being installed.

### Mounting

The G2 and T2 transducers require no special mounting hardware and can be mounted in any orientation with negligible position error. Although the units can withstand considerable vibration without damage or significant output effects, it is always good practice to mount the transducer where there is minimum vibration. For units with NPT type pressure fittings apply sealing tape or an equivalent sealant to the threads before installing. When installing or removing the unit apply a wrench to the hex wrench flats, located above the pressure fitting. **DO NOT** tighten by using a pipe wrench on the housing. A 27mm (1 1/8") wrench can be used on the wrench flats of the hex. For G2 models with detachable electrical connectors a 6 point deep socket can also be used to install the unit.

### Electro-Magnetic Interference

The circuitry of the G2 and T2 transducers is designed to minimize the effect of electromagnetic and radio frequency interference. To minimize susceptibility to noise, avoid running the termination wiring in a conduit which contains high current AC power cables. Where possible avoid running the termination wiring near inductive equipment.

### Field Adjustments

The G2 and T2 transducers are precisely calibrated and temperature compensated at the factory to ensure long and stable performance. There are no field accessible adjustments on the G2 or T2 transducers.

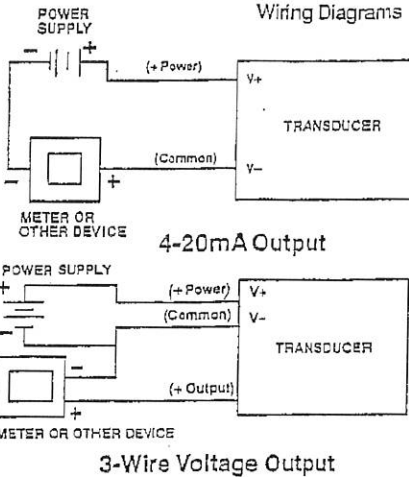
### ELECTRICAL INSTALLATION

Please refer to the reverse of this page for power supply requirements and for appropriate wiring protocol based on the particular output signal and electrical termination features of the unit being installed.

# G2 & T2 PRESSURE TRANSMITTER INSTRUCTION SHEET



## G2 & T2 ELECTRICAL INSTALLATION



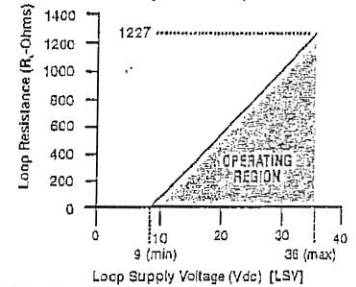
### Power Supply Requirements:

Output Signal	Min Supply	Max Supply
Ratiometric* (0.5V to 4.5V)	4.5Vdc	5.5Vdc
0-5Vdc	9Vdc	36Vdc
1-5Vdc	9Vdc	36Vdc
1-6Vdc	9Vdc	36Vdc
0-10V	14Vdc	36Vdc
4-20mA**	9Vdc	36Vdc

\*0.5Vdc-4.5Vdc output is ratiometric to the nominal 5Vdc supply

\*\*For transmitters with 4-20mA output signal, the minimum voltage at the terminals is 9Vdc. However, the minimum supply voltage should be calculated using the adjacent graph and formula.

### Power Supply Voltage vs Loop Resistance (4-20mA ONLY)



To determine minimum loop supply voltage:  
 $LSV(\min) = 9(V) + [0.22(A) \cdot R_L]$

Where:  
 LSV = Loop Supply Voltage (Vdc)  
 $R_L = R_G + R_W$  (ohms)  
 $R_L$  = Loop Resistance (ohms)  
 $R_G$  = Sense Resistance (ohms) [Measuring Instrument]  
 $R_W$  = Wiring Resistance (ohms)

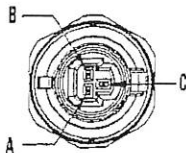
## G2 ELECTRICAL TERMINATIONS AND WIRING

### 3-PIN DELPHI (PACKARD) METRI-PACK 150 SERIES

Mates to Optional Metri-Pack connector 12085297

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
A	Common	V -	Black
B	V +	V +	Red
C	Output	V -	White

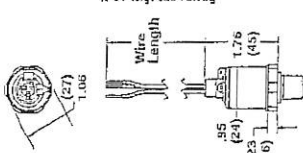
IP67 Ingress rating



### SHIELDED CABLE, PVC JACKET, 24AWG LEADS

Wire Color	Voltage Output	4-20mA Output*
Red	V +	V +
Black	Common	V -
White	Output	V -
Bare**	Shield Drain Wire	Shield Drain Wire

IP67 Ingress rating

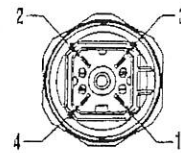


### HIRSCHMANN G SERIES

Mates to Optional Hirschmann 6-W1F connector, or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V +	V +	Red
2	Common	V -	Black
3	Output	V -	White
4	Case Gnd.	Case Gnd.	Green

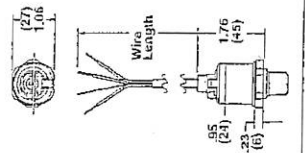
IP67 Ingress rating



### FLYING LEADS 18AWG

Wire Color	Voltage Output	4-20mA Output*
Red	V +	V +
Black	Common	V -
White	Output	V -

IP67 Ingress rating



\* Use either V- termination on G2 with 4-20mA output

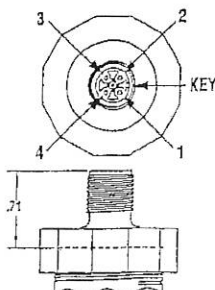
## T2 ELECTRICAL TERMINATIONS AND WIRING

### M12 ELECTRICAL TERMINATION (E1), (E2), (E3)

Mates to optional Hirschmann connector Part 933 172-100 or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V +	V +	Red
2	Output	None	White
3	Case Gnd.	Case Gnd.	Green
4	Common	Common	Black

IP65 Ingress rating

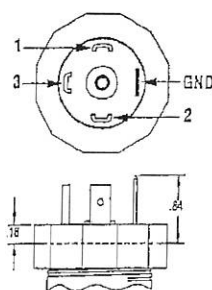


### DIN 43650-A ELECTRICAL TERMINATION (D1), (D2), (D3)

Mates to optional Hirschmann connector 6DM 3089 or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V +	V +	Red
2	Common	Common	Black
3	Output	None	White
GND	Case Gnd.	Case Gnd.	Green

IP65 Ingress rating

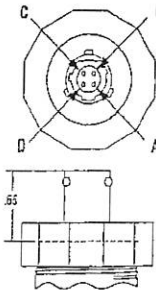


### 4-PIN BENDIX STYLE ELECTRICAL TERMINATION (B4), (H1), (L1), (P2)

Mates to optional Amphenol Bendix connector PTO6A-8-4-SR or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
A	V +	V +	Red
B	Output	None	White
C	Case Gnd.	Case Gnd.	Green
D	Common	Common	Black

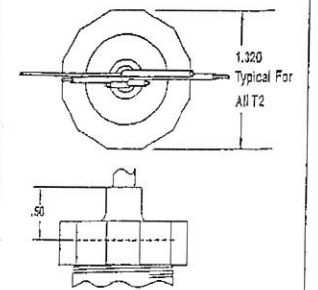
IP65 Ingress rating



### SHIELDED CABLE, PVC JACKET, 24 AWG LEADS, TERMINATION (F2), (P1)

Wire Color	Voltage Output	4-20mA Output*
Red	V +	V +
White	Output	None
Black	Common	Common
Green	Case Gnd.	Case Gnd.
Bare**	Drain Wire	Drain Wire

IP65 Ingress rating



\*\* Where shielded wiring is being used; Connect the drain wire to the guard terminal on the read out device or measuring instrument if available. In all other cases connect to the ground of the power supply negative terminal.

# G2 & T2 PRESSURE TRANSMITTER INSTRUCTION SHEET

# ASHCROFT®

## **⚠ WARNING! READ ⚠ BEFORE INSTALLATION**

### 1. GENERAL:

A failure resulting in injury or damage may be caused by excessive overpressure, excessive vibration or pressure pulsation, excessive instrument temperature, corrosion of the pressure containing parts, or other misuse. Consult Ashcroft Inc., Stratford, Connecticut, USA before installing if there are any questions or concerns.

### 2. OVERPRESSURE:

Pressure spikes in excess of the rated overpressure capability of the transducer may cause irreversible electrical and/or mechanical damage to the pressure measuring and containing elements.

**Fluid hammer** and surges can destroy any pressure transducer and must always be avoided. A pressure snubber should be installed to eliminate the damaging hammer effects. Fluid hammer occurs when a liquid flow is suddenly stopped, as with quick closing solenoid valves. Surges occur when flow is suddenly begun, as when a pump is turned on at full power or a valve is quickly opened.

**Liquid surges** are particularly damaging to pressure transducers if the pipe is originally empty. To avoid damaging surges, fluid lines should remain full (if possible), pumps should be brought up to power slowly, and valves opened slowly. To avoid damage from both fluid hammer and surges, a surge chamber should be installed.

Symptoms of fluid hammer and surge's damaging effects:

- Pressure transducer exhibits an output at zero pressure (large zero offset).
- Pressure transducer output remains constant regardless of pressure
- In severe cases, there will be no output.

### FREEZING:

Prohibit freezing of media in pressure port. Unit should be drained (mount in vertical position with electrical termination upward) to prevent possible overpressure damage from frozen media.

### 3. STATIC ELECTRICAL CHARGES:

Any electrical device may be susceptible to damage when exposed to static electrical charges. To avoid damage to the transducer observe the following:

- Ground the body of the transducer BEFORE making any electrical connections.
- When disconnecting, remove the ground LAST!

Note: The shield and drain wire in the cable (if supplied) is not connected to the transducer body, and is not a suitable ground.

### 4. USE IN LIFE SUPPORT DEVICES

Ashcroft Inc. products are not authorized for use as critical components in life support devices or systems without the express written approval of the General Manager, Stratford Operations of Ashcroft Inc. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

### DESCRIPTION

The Ashcroft Model G2 and T2 pressure transducers are high performance instruments intended for use in industrial applications where the process media is compatible with the 17-4PH stainless steel sensor material and the 304 SS process connection.

### MECHANICAL INSTALLATION

#### Environmental

The G2 and T2 transducers can be stored and used within the temperature limits of -40°C to 125°C (-40°F to 257°F). Ingress protection ratings of the units are dependent on the electrical termination specified. Refer to the wiring diagrams on the reverse for the IP rating of the unit which is being installed.

### Mounting

The G2 and T2 transducers require no special mounting hardware and can be mounted in any orientation with negligible position error. Although the units can withstand considerable vibration without damage or significant output effects, it is always good practice to mount the transducer where there is minimum vibration. For units with NPT type pressure fittings apply sealing tape or an equivalent sealant to the threads before installing. When installing or removing the unit apply a wrench to the hex wrench flats, located above the pressure fitting. **DO NOT** tighten by using a pipe wrench on the housing. A 27mm (1 1/8") wrench can be used on the wrench flats of the hex. For G2 models with detachable electrical connectors a 6 point deep socket can also be used to install the unit.

### Electro-Magnetic Interference

The circuitry of the G2 and T2 transducers is designed to minimize the effect of electromagnetic and radio frequency interference. To minimize susceptibility to noise, avoid running the termination wiring in a conduit which contains high current AC power cables. Where possible avoid running the termination wiring near inductive equipment.

### Field Adjustments

The G2 and T2 transducers are precisely calibrated and temperature compensated at the factory to ensure long and stable performance. There are no field accessible adjustments on the G2 or T2 transducers.

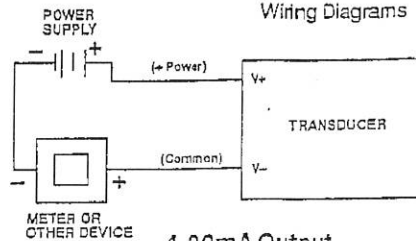
### ELECTRICAL INSTALLATION

Please refer to the reverse of this page for power supply requirements and for appropriate wiring protocol based on the particular output signal and electrical termination features of the unit being installed.

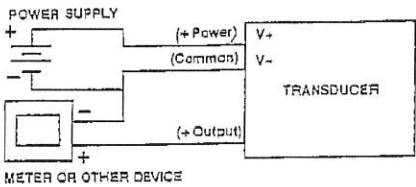
# G2 & T2 PRESSURE TRANSMITTER INSTRUCTION SHEET



## G2 & T2 ELECTRICAL INSTALLATION



4-20mA Output



3-Wire Voltage Output

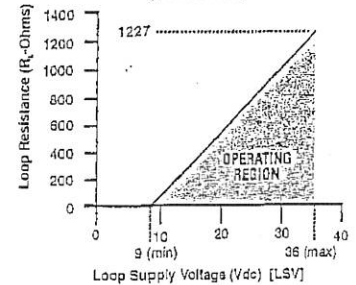
### Power Supply Requirements:

Output Signal	Min Supply	Max Supply
Ratiometric* (0.5V to 4.5V)	4.5Vdc	5.5Vdc
0-5Vdc	9Vdc	36Vdc
1-5Vdc	9Vdc	36Vdc
1-6Vdc	9Vdc	36Vdc
0-10V	14Vdc	36Vdc
4-20mA**	9Vdc	36Vdc

\*0.5Vdc-4.5Vdc output is ratiometric to the nominal 5Vdc supply

\*\*For transmitters with 4-20mA output signal, the minimum voltage at the terminals is 9Vdc. However, the minimum supply voltage should be calculated using the adjacent graph and formula.

### Power Supply Voltage vs Loop Resistance (4-20mA ONLY)



To determine minimum loop supply voltage:  
 $LSV(\min) = 9(V) + (.022(A) \cdot R_L$

Where:

- LSV = Loop Supply Voltage (Vdc)
- $R_L = R_C + R_W$  (ohms)
- $R_C$  = Loop Resistance (ohms)
- $R_S$  = Sense Resistance (ohms) (Measuring Instrument)
- $R_W$  = Wiring Resistance (ohms)

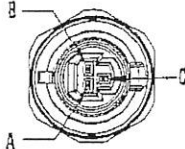
## G2 ELECTRICAL TERMINATIONS AND WIRING

### 3-PIN DELPHI (PACKARD) METRI-PACK 150 SERIES

Mates to Optional Metri-Pack connector 12065287

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
A	Common	V-	Black
B	V+	V+	Red
C	Output	V-	White

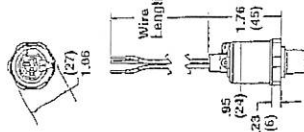
IP57 Ingress rating



### SHIELDED CABLE, PVC JACKET, 24AWG LEADS

Wire Color	Voltage Output	4-20mA Output*
Red	V+	V+
Black	Common	V-
White	Output	V-
Bare**	Shield Drain Wire	Shield Drain Wire

IP67 Ingress rating

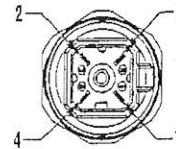


### HIRSCHMANN G SERIES

Mates to Optional Hirschmann G4W1F connector, or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V+	V+	Red
2	Common	V-	Black
3	Output	V-	White
4	Case Gnd.	Case Gnd.	Green

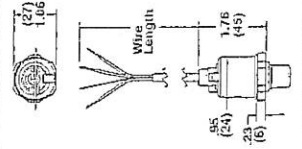
IP67 Ingress rating



### FLYING LEADS #8AWG

Wire Color	Voltage Output	4-20mA Output*
Red	V+	V+
Black	Common	V-
White	Output	V-

IP67 Ingress rating



\* Use either V- termination on G2 with 4-20mA output

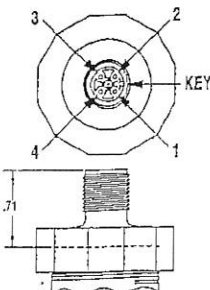
## T2 ELECTRICAL TERMINATIONS AND WIRING

### M12 ELECTRICAL TERMINATION (E1), (E2), (E3), (E4)

Mates to optional Hirschmann connector Part 930 172-100 or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V+	V+	Red
2	Output	None	White
3	Case Gnd.	Case Gnd.	Green
4	Common	Common	Black

IP65 Ingress rating

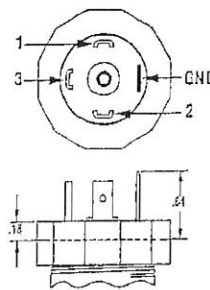


### DIN 43650-A ELECTRICAL TERMINATION (D1), (D2), (D3), (D4)

Mates to optional Hirschmann connector SEM 3009 or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
1	V+	V+	Red
2	Common	Common	Black
3	Output	None	White
GND	Case Gnd.	Case Gnd.	Green

IP65 Ingress rating

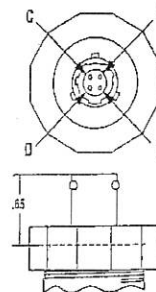


### 4-PIN BENDIX STYLE ELECTRICAL TERMINATION (B4), (H1), (L1), (P2)

Mates to optional Amphenol Bendix connector PT05A-3-4-SR or equal

Pin No.	Voltage Output	4-20mA Output*	Mating Cable Color
A	V+	V+	Red
B	Output	None	White
C	Case Gnd.	Case Gnd.	Green
D	Common	Common	Black

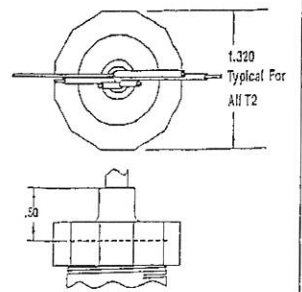
IP65 Ingress rating



### SHIELDED CABLE, PVC JACKET, 24 AWG LEADS, TERMINATION (F2), (P1)

Wire Color	Voltage Output	4-20mA Output
Red	V+	V+
White	Output	None
Black	Common	Common
Green	Case Gnd.	Case Gnd.
Bare**	Drain Wire	Drain Wire

IP65 Ingress rating



\*\* Where shielded wiring is being used; Connect the drain wire to the guard terminal on the read out device or measuring instrument if available. In all other cases connect to the ground of the power supply negative terminal.



Direct Acting  
**General Service Solenoid Valves**  
 Brass or Stainless Steel Bodies  
 1/8" to 1/4" NPT

**3/2**  
**SERIES**  
**8320**

**Features**

- All NPT connections are in the valve body to allow in-line piping
- No Minimum Operating Pressure Differential required
- Broadest range of applications
- Mountable in any position

**Construction**

Valve Parts in Contact with Fluids		
Body	Brass	303 Stainless Steel
Seals and Disc	NBR or Cast UR, as Listed	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Core Springs	302 Stainless Steel	
Shading Coil	Copper	Silver
Disc-Holder	CA	
Core Guide	CA (10.1 and 17.1 Watt only)	

**Electrical**

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
	DC Watts	AC			General Purpose		Explosionproof	
		Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	10.6	6.1	16	30	238210	238310	238214	238314
F	-	9.1	25	40	238210	-	238214	-
F	11.6	10.1	25	50	238610	238710	238614	238714
F	22.6	17.1	40	70	238610	238710	238614	238714

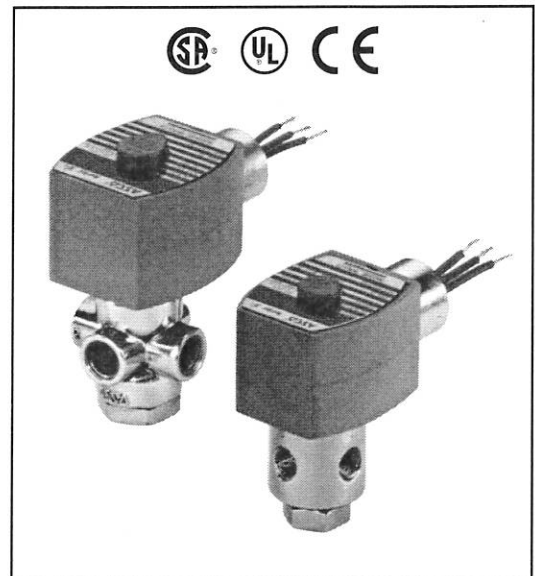
**Standard Voltages:** 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering. Other voltages are available when required.

**Solenoid Enclosures**

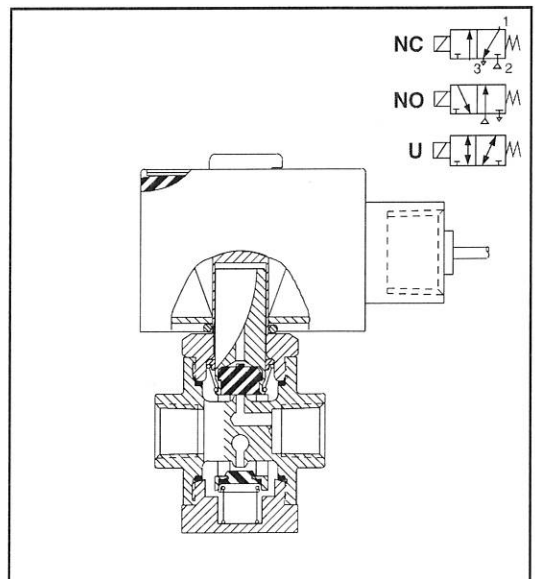
**Standard:** Watertight, Types 1, 2, 3, 3S, 4, and 4X.

**Optional:** Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9. (To order, add prefix "EF" to the catalog number.)

See *Optional Features Section* for other available options.



3-WAY



**Nominal Ambient Temp. Ranges**

AC: 32°F to 125°F (0°C to 52°C)

DC: 32°F to 104°F (0°C to 40°C)

**Note:** Some stainless steel constructions are rated -40°F (-40°C). See note ④ in specifications table. Refer to *Engineering Section* for details.

**Approvals**

CSA certified. UL listed General Purpose Valves. Meets applicable CE directives.

SIL 3 capable per IEC 61508 on normally closed const. Third party certification provided by EXIDA.

Refer to *Engineering Section* for details.



**Specifications (English units)**

Pipe Size (ins.)	Orifice Size (ins.)	Cv Flow Factor	Operating Pressure Differential (psi)						Max. Fluid Temp. °F		Brass Body		Stainless Steel Body		Watt Rating/Class of Coil Insulation ②	
			Max. AC			Max. DC					Catalog Number	Const. Ref.	Catalog Number	Const. Ref.	AC	DC
			Air-Inert Gas	Water	Lt. Oil @ 300 SSU	Air-Inert Gas	Water	Lt. Oil @ 300 SSU	AC	DC						
<b>UNIVERSAL OPERATION (Pressure at any port)</b>																
1/8	3/64	0.06	175	175	175	125	125	125	140	120	8320G130 ①	1	8320G140 ①	1	9.1F	10.6F
1/8	1/16	0.09	100	100	100	65	65	65	180	120	8320G001	1	8320G041 ③	1	9.1F	10.6F
1/8	1/16	0.09	175	175	175	125	125	125	200	150	8320G212	4	8320G221 ④	4	17.1/F	22.6/F
1/8	3/32	0.12	50	50	50	50	50	50	180	120	8320G083	1	8320G087 ③	1	6.1/F	10.6/F
1/8	3/32	0.12	100	100	100	60	60	60	200	150	8320G213	4	8320G222 ④	4	17.1/F	11.6/F
1/8	1/8	0.21	30	30	30	20	20	20	180	120	8320G003	1	8320G043 ③	1	9.1/F	10.6/F
1/8	1/8	0.21	50	50	50	25	25	25	200	150	8320G214	4	8320G223 ④	4	17.1/F	11.6/F
1/4	1/16	0.09	125	130	130	75	75	75	200	150	8320G172	2	-	-	10.1/F	11.6/F
1/4	1/16	0.09	175	175	175	125	125	125	200	150	-	-	8320G230 ④	3	17.1/F	22.6/F
1/4	3/32	0.12	100	100	100	60	60	60	200	150	8320G174	2	8320G200 ③④	3	17.1/F	11.6/F
1/4	1/8	0.25	50	50	50	25	25	25	200	150	8320G176	2	8320G201 ③④	3	17.1/F	11.6/F
1/4	11/64	0.35	20	20	20	12	12	12	200	150	8320G178	2	-	-	10.1/F	11.6/F
<b>NORMALLY CLOSED (Closed when de-energized) – PFD<sub>AVG</sub> = 6.81 x 10<sup>-4</sup></b>																
1/8	3/64	0.06	200	200	200	200	200	200	180	120	8320G132	1	8320G142 ③	1	6.1F	10.6/F
1/8	1/16	0.09	150	125	125	125	125	125	180	120	8320G013	1	8320G045 ③	1	6.1F	10.6/F
1/8	1/16	0.09	210	225	225	160	160	160	200	150	8320G215	4	8320G224 ④	4	17.1/F	11.6/F
1/8	3/32	0.12	100	100	100	100	100	100	180	120	8320G015	1	8320G047 ③	1	6.1F	10.6/F
1/8	3/32	0.12	150	150	150	115	115	115	200	150	8320G216	4	8320G225 ④	4	10.1/F	11.6/F
1/8	1/8	0.21	40	40	40	40	40	40	180	120	8320G017	1	8320G049 ③	1	6.1F	10.6/F
1/8	1/8	0.21	85	85	85	60	60	60	200	150	8320G217	4	8320G226 ④	4	10.1/F	11.6/F
1/4	1/16	0.09	210	225	225	160	160	160	200	150	8320G182	2	8320G231 ④	3	17.1/F	11.6/F
1/4	3/32	0.12	150	150	150	115	115	115	200	150	8320G184	2	8320G202 ③④	3	10.1/F	11.6/F
1/4	1/8	0.25	85	85	85	60	60	60	200	150	8320G186	2	8320G203 ③④	3	10.1/F	11.6/F
1/4	11/64	0.35	45	45	45	25	25	25	200	150	8320G188	2	-	-	10.1/F	11.6/F
<b>NORMALLY OPEN (Open when de-energized)</b>																
1/8	3/64	0.06	200	200	200	200	200	200	180	120	8320G136	1	8320G146 ③	1	6.1F	10.6/F
1/8	1/16	0.09	150	125	125	125	125	125	180	120	8320G027	1	8320G051 ③	1	6.1F	10.6/F
1/8	1/16	0.09	235	250	250	160	160	160	200	150	8320G218	4	8320G227 ④	4	17.1/F	11.6/F
1/8	3/32	0.12	100	100	100	100	100	100	180	120	8320G029	1	8320G053 ③	1	6.1F	10.6/F
1/8	3/32	0.12	150	140	140	100	100	100	200	150	8320G219	4	8320G228 ④	4	10.1/F	11.6/F
1/8	1/8	0.21	40	40	40	40	40	40	180	120	8320G031	1	8320G055 ③	1	6.1F	10.6/F
1/8	1/8	0.21	70	70	70	55	55	55	200	150	8320G220	4	8320G229 ④	4	10.1/F	11.6/F
1/4	1/16	0.09	235	250	250	160	160	160	200	150	8320G192	2	8320G232 ④	3	17.1/F	11.6/F
1/4	3/32	0.12	150	140	140	100	100	100	200	150	8320G194	2	8320G204 ③④	3	10.1/F	11.6/F
1/4	1/8	0.25	70	70	70	55	55	55	200	150	8320G196	2	8320G205 ③④	3	10.1/F	11.6/F
1/4	11/64	0.35	40	40	40	30	30	30	200	150	8320G198	2	-	-	10.1/F	11.6/F

① Supplied with cast UR disc.  
 ② On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts; the watt rating for the 9.1/F solenoid is 11.1 watts.  
 ③ Can be used for **dry** natural gas service with the EF prefix.  
 ④ Constructions standard rated -40°F (-40°C) ambient temperature. EFX prefix and TPL # not required.



**3/2  
SERIES  
8320**

**Specifications (Metric units)**

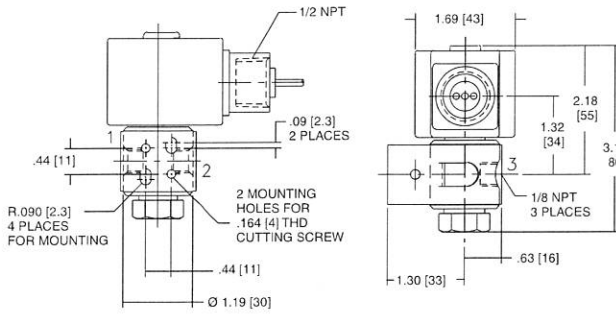
3-WAY

Pipe Size (ins.)	Orifice Size (mm)	Kv Flow Factor (m3/h)	Operating Pressure Differential (bar)						Max. Fluid Temp. °C		Brass Body		Stainless Steel Body		Watt Rating/ Class of Coil Insulation <sup>②</sup>	
			Max. AC			Max. DC					Catalog Number	Const. Ref.	Catalog Number	Const. Ref.	AC	DC
			Air-Inert Gas	Water	Lt. Oil @ 300 SSU	Air-Inert Gas	Water	Lt. Oil @ 300 SSU	AC	DC						
<b>UNIVERSAL OPERATION (Pressure at any port)</b>																
1/8	1.2	0.05	12	12	12	9	9	9	60	49	8320G130 ①	1	8320G140 ①	1	9.1F	10.6F
1/8	1.6	0.08	7	7	7	4	4	4	82	49	8320G001	1	8320G041 ③	1	9.1F	10.6F
1/8	1.6	0.08	12	12	12	9	9	9	93	66	8320G212	4	8320G221 ④	4	17.1/F	22.6/F
1/8	2.4	0.10	3	3	3	3	3	3	82	49	8320G083	1	8320G087 ③	1	6.1/F	10.6/F
1/8	2.4	0.10	7	7	7	4	4	4	93	66	8320G213	4	8320G222 ④	4	17.1/F	11.6/F
1/8	3.2	0.18	2	2	2	1	1	1	82	49	8320G003	1	8320G043 ③	1	9.1/F	10.6/F
1/8	3.2	0.18	3	3	3	2	2	2	93	66	8320G214	4	8320G223 ④	4	17.1/F	11.6/F
1/4	1.6	0.08	9	9	9	5	5	5	93	66	8320G172	2	-	-	10.1/F	11.6/F
1/4	1.6	0.08	12	12	12	9	9	9	93	66	-	-	8320G230 ④	3	17.1/F	22.6/F
1/4	2.4	0.10	7	7	7	4	4	4	93	66	8320G174	2	8320G200 ③④	3	17.1/F	11.6/F
1/4	3.2	0.21	3	3	3	2	2	2	93	66	8320G176	2	8320G201 ③④	3	17.1/F	11.6/F
1/4	4.4	0.30	1	1	1	1	1	1	93	66	8320G178	2	-	-	10.1/F	11.6/F
<b>NORMALLY CLOSED (Closed when de-energized) – PFD<sub>AVG</sub> = 6.81 x 10<sup>-4</sup></b>																
1/8	1.2	0.05	14	14	14	14	14	14	82	49	8320G132	1	8320G142 ③	1	6.1F	10.6/F
1/8	1.6	0.08	10	9	9	9	9	9	82	49	8320G013	1	8320G045 ③	1	6.1F	10.6/F
1/8	1.6	0.08	14	15	15	11	11	11	93	66	8320G215	4	8320G224 ④	4	17.1/F	11.6/F
1/8	2.4	0.10	7	7	7	7	7	7	82	49	8320G015	1	8320G047 ③	1	6.1F	10.6/F
1/8	2.4	0.10	10	10	10	8	8	8	93	66	8320G216	4	8320G225 ④	4	10.1/F	11.6/F
1/8	3.2	0.18	3	3	3	3	3	3	82	49	8320G017	1	8320G049 ③	1	6.1F	10.6/F
1/8	3.2	0.18	6	6	6	4	4	4	93	66	8320G217	4	8320G226 ④	4	10.1/F	11.6/F
1/4	1.6	0.08	14	15	15	11	11	11	93	66	8320G182	2	8320G231 ④	3	17.1/F	11.6/F
1/4	2.4	0.10	10	10	10	8	8	8	93	66	8320G184	2	8320G202 ③④	3	10.1/F	11.6/F
1/4	3.2	0.21	6	6	6	4	4	4	93	66	8320G186	2	8320G203 ③④	3	10.1/F	11.6/F
1/4	4.4	0.30	3	3	3	2	2	2	93	66	8320G188	2	-	-	10.1/F	11.6/F
<b>NORMALLY OPEN (Open when de-energized)</b>																
1/8	1.2	0.05	14	14	14	14	14	14	82	49	8320G136	1	8320G146 ③	1	6.1F	10.6/F
1/8	1.6	0.08	10	9	9	9	9	9	82	49	8320G027	1	8320G051 ③	1	6.1F	10.6/F
1/8	1.6	0.08	16	17	17	11	11	11	93	66	8320G218	4	8320G227 ④	4	17.1/F	11.6/F
1/8	2.4	0.10	7	7	7	7	7	7	82	49	8320G029	1	8320G053 ③	1	6.1F	10.6/F
1/8	2.4	0.10	10	10	10	7	7	7	93	66	8320G219	4	8320G228 ④	4	10.1/F	11.6/F
1/8	3.2	0.18	3	3	3	3	3	3	82	49	8320G031	1	8320G055 ③	1	6.1F	10.6/F
1/8	3.2	0.18	5	5	5	4	4	4	93	66	8320G220	4	8320G229 ④	4	10.1/F	11.6/F
1/4	1.6	0.08	16	17	17	11	11	11	93	66	8320G192	2	8320G232 ④	3	17.1/F	11.6/F
1/4	2.4	0.10	10	10	10	7	7	7	93	66	8320G194	2	8320G204 ③④	3	10.1/F	11.6/F
1/4	3.2	0.21	5	5	5	4	4	4	93	66	8320G196	2	8320G205 ③④	3	10.1/F	11.6/F
1/4	4.4	0.30	3	3	3	2	2	2	93	66	8320G198	2	-	-	10.1/F	11.6/F

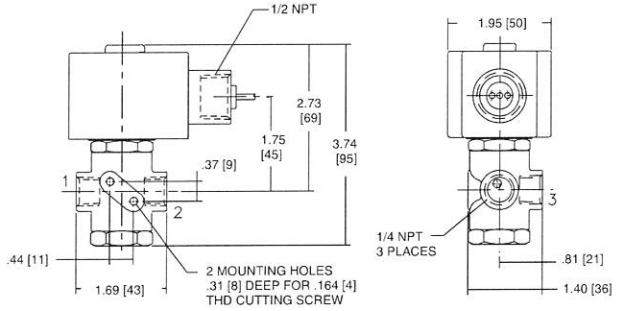
① Supplied with cast UR disc.  
 ② On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts; the watt rating for the 9.1/F solenoid is 11.1 watts.  
 ③ Can be used for *dry* natural gas service with the EF prefix.  
 ④ Constructions standard rated -40°F (-40°C) ambient temperature. EFX prefix and TPL # not required.

**Dimensions: inches (mm)**

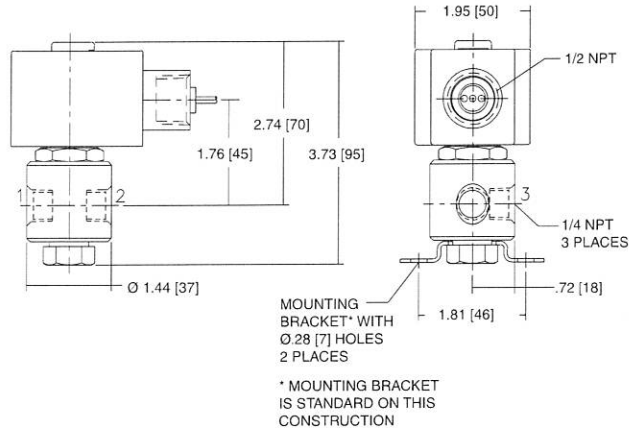
**Const. Ref. 1**



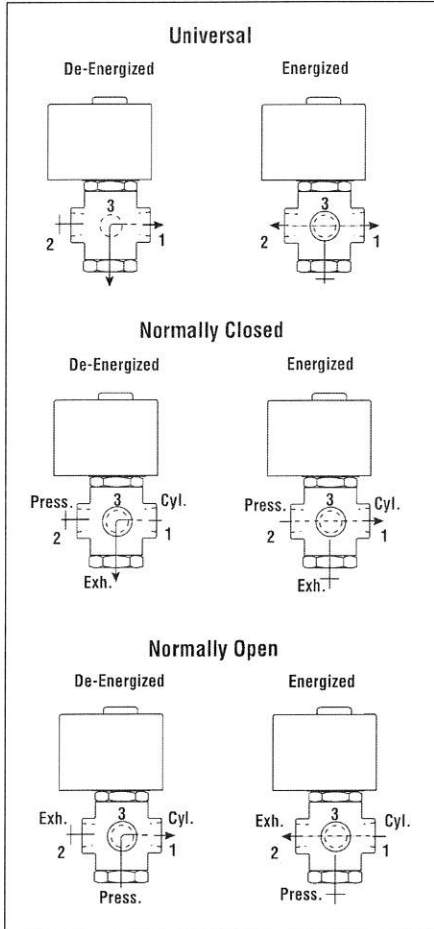
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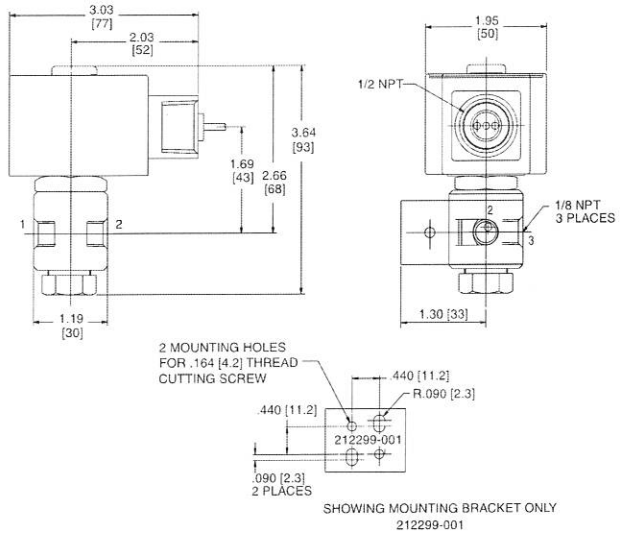
**Const. Ref. 3**



**FLOW DIAGRAMS**



**Const. Ref. 4**



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### OPW 1000 Series Self-Service Nozzles (NGV1 Type 1) (CT1000)



OPW 1000 Series self-service nozzles are designed for high flow public and private CNG fueling systems. Applications include quick-fill, self-service fueling of automobiles, light trucks, shuttle buses and vans. All OPW NGV fueling nozzles are designed and built to exacting engineering specifications for fueling safety and efficiency

#### **Table of Contents:**

1. Features
2. Dimensions
3. Ordering Specifications

## Features:

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- User-Friendly Single-Action Operation - Engage nozzle and receptacle with a 180° rotation of the handle. This secures nozzle jaws onto receptacle, activating a system of three internal valves that regulate fueling. The nozzle will not dispense gas until securely engaged onto an appropriate receptacle. When fueling is complete, rotate the handle to the disconnect position to automatically stop the flow of gas into the vehicle, vent the trapped gas, and release the nozzle from the receptacle. The 1000 Series nozzles connect directly to the hose, with no need for a three-way valve. Designed for public or private self-service applications, no attendant is needed.
- High Flow/Fast-Fill Capability - Provides quick fueling of medium storage vehicles. Internal seals are designed for fast-fill NGV fueling.
- Internal Filter - Captures gas-borne debris commonly found in CNG systems. Filter protects against impurities in the high velocity gas stream that can damage the nozzle and receptacle seals and the vehicle fuel system.
- Directed Vent (CT1000) - Captures the gas vented at disconnect and directs it out of the nozzle via a 1/4" stainless-steel vent tube which can be piped to a remote venting location or back to the upstream side of the compressor. Capturing vent gas is environmentally desirable by agencies such as EPA, and provides an added measure of safety by minimizing the amount of gas present at the filling site. It also reduces vent noise and eliminates escaped gas smell.
- Jaw-Lock Technology - Designed specifically for the frequent coupling and uncoupling of the high pressure gas connections of NGV fueling. Forces at the contact point are distributed over the entire surface area of the receptacle.
- Ergonomic Design - One simple and convenient motion ensures connection and dispensing by all users. Insulated jacket protects operator's hand.
- Durable Construction - Heavy-duty brass and stainless-steel construction provides corrosion resistance in the harsh refueling environment.
- Meets NGV1 Fueling Standard - Can be used to fuel any vehicle with an NGV1 profile receptacle.
- Tamper Resistant - Specially designed cam system actuates the front and rear module. Tampering with the valve results in immediate dispensing shut-off.
- Individually Leak Tested and Inspected with Traceable Serial Number.
- Agency Listings - ASME Pressure Vessel Registered, Railroad Commission of Texas, ANSI/AGA/CGA NGV1 Type 1 (CT1000). Class A Certified, German Pressure Vessel Ordinance (Druckbeh V) Approved (P30 models only). Bauart number 02CDN1

## Materials:

Body: Brass

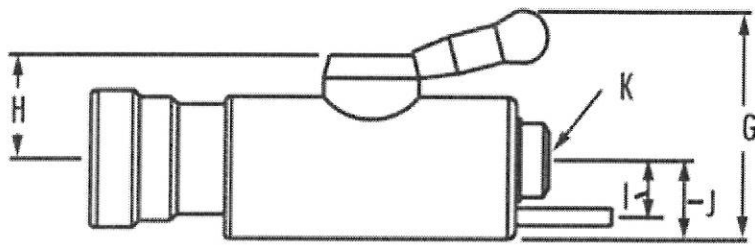
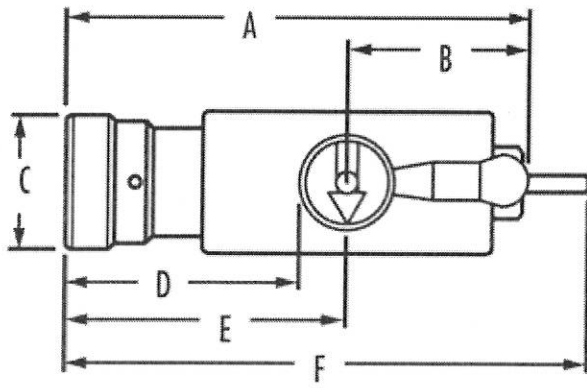
Internal Components: Stainless Steel

Seals: Specially blended polymers and elastomers specific to high pressure NGV

## Dimensions

	CC1000		CT1000S		CT1000L/CT1000P36	
	in	mm	in	mm	in	mm
A	6.25	159.1	6.69	167.8	7.32	185.8
B	2.56	66.1	2.63	65.4	2.63	66.4
C	1.94	49.4	1.94	48.9	1.94	48.9
D	3	75.5	3.37	85.1	4	102.1
E	3.69	93	4.06	102.4	4.69	119.4
F	N/A	N/A	7.5	191	8.19	208
G	3.06	78.5	3.25	83.1	3.25	83.1
H	1.5	37.9	1.5	37.9	1.5	37.9
I	N/A	N/A	1.37	20.7	0.81	20.7
J	1.5	24.2	1.13	28.8	1.13	28.8
K	Straight Thread O-Ring Boss Port		SAE J1926-6 (9/16-18UNF-2B)			

## Key



## Specifications:

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Min. Flow Rate: 1200 SCFM @ 3000 psid

Temperature Range: -40° C to 85° C  
(-40° F to 185° F)

Weight: 1.52 kg. (3.35 lb.)

Cv: 0.48

Design Pressure: 4500 psi (310 Bar)

## Certified

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## Ordering Information

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Product No.	Inlet Thread Size	Maximum Allowable Service Pressure
CC1000	SAE - 6, 9/16 - 18 UNF	3000 psi (200 Bar)
CC1000S (Same as CC1000 with Stainless Steel Jaws)	3000 psi (200 Bar)	
CT1000S (directed vent)	SAE - 6, 9/16 - 18 UNF	3000 psi (200 Bar)
CT1000SS (Same as CT1000S with Stainless Steel Jaws)	3000 psi (200 Bar)	
CT1000L (Same as CT1000S and (directed vent) includes Guide Ring)	3000 psi (200 Bar)	
CT1000LS (Same as CT1000L with Stainless Steel Jaws)	3000 psi (200 Bar)	
CT1000-P36 (directed vent)	SAE - 6, 9/16 - 18 UNF	3600 psi (248 Bar)
CT1000-P36S (directed vent)	SAE - 6, 9/16 - 18 UNF	3600 psi (248 Bar)



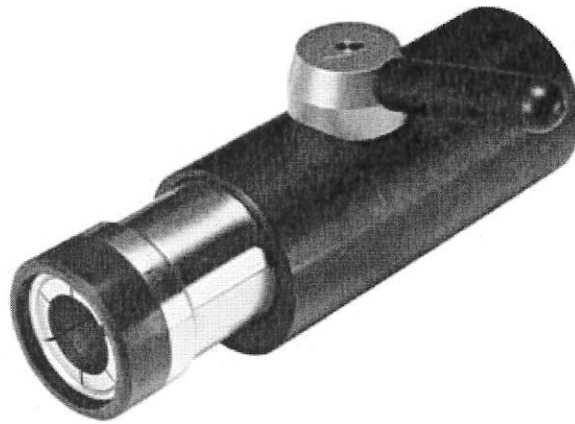
A156	CT1000S S.S. Jaw Replacement Kit
A158	CT1000L S.S. Jaw Replacement Kit
A159	CT1000-P36. S.S. Jaw Replacement Kit

NOTE: Available with Stainless Steel Jaws for more demanding applications. Add suffix S to product number. • Connects to any L-Series-NGV-1 CNG Receptacle

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### OPW 5000 Series Bus/Heavy-Duty Truck Nozzles (CC5000S CT5000S)



OPW 5000 Series nozzles are designed for extremely high flow public and private CNG fueling systems. Applications include quick-fill, self-service fueling of transit buses and large trucks. All OPW NGV fueling nozzles are designed and built to exacting engineering specifications for fueling safety and efficiency.

#### **Table of Contents:**

1. Features
2. Ordering Specifications

### **Key Features Include:**

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- User-Friendly Single-Action Operation - Entire fueling operation is initiated by simply engaging nozzle and receptacle with a single 180 degree rotation of the handle. This automatically secures the nozzle jaws onto the receptacle and activates a system of three internal valves that regulate fueling. The nozzle will not dispense gas until securely engaged onto an appropriate receptacle. When fueling is completed, rotation of the handle to the disconnect position automatically stops the flow of gas into the nozzle, vents the trapped gas, and releases the nozzle from the receptacle. The 5000 Series nozzles connect directly to the hose, eliminating the need for a three-way valve. They are designed for public or private self-service applications, eliminating the need for a trained attendant.
- High Flow/Fast-Fill Capability - To provide quick fueling of large storage vehicles. Internal seals are specially designed to meet the demands of fast-fill NGV fueling.
- Directed Vent (CT5000S) - Directs the gas vented at disconnect and directs it out of the nozzle via a 3/8" stainless-steel tubing connection which can be piped to a remote venting location or back to the upstream side of the compressor. Directing the vent gas is environmentally desirable and will provide an added measure of safety by minimizing the amount of gas present at the filling site. It also reduces vent noise and escaped gas smell.
- Jaw-Lock Technology - Designed specifically for the frequent coupling and uncoupling of the high pressure gas connections of NGV fueling. Forces at the contact point are distributed over the entire surface area of the receptacle.
- Ergonomic Design - One simple and convenient motion ensures connection and dispensing by all users. Insulated jacket provides thermal protection for operator's hand.
- Durable Construction - Heavy-duty brass and stainless-steel construction provides excellent corrosion resistance in the harsh refueling environment.
- Tamper Resistant - Specially designed cam system actuates the front and rear valve module. Any tampering with the valve will result in an immediate shut-off of the dispensing process.
- Individually Leak Tested and Inspected with Traceable Serial Numbers.
- Agency Listings - ASME Pressure Vessel Registered, Railroad Commission of Texas, Special Application of German Pressure Vessel Available at additional TUV cost.

### **Materials:**

Body: Brass & Stainless Steel

Internal Components: Stainless Steel and Brass

Seals: Specially formulated polymers and elastomers specific to high pressure NGV applications.

### Specifications:

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Min. Flow Rate: 5000 SCFM @ 3000 psid

Temperature Range: -40° C to 85° C  
(-40° F to 185° F)

Weight: 3.98 kg. (8.77 lbs.)

Cv: 2.75

Design Pressure: 4500 psi (310 Bar)

### Ordering Information

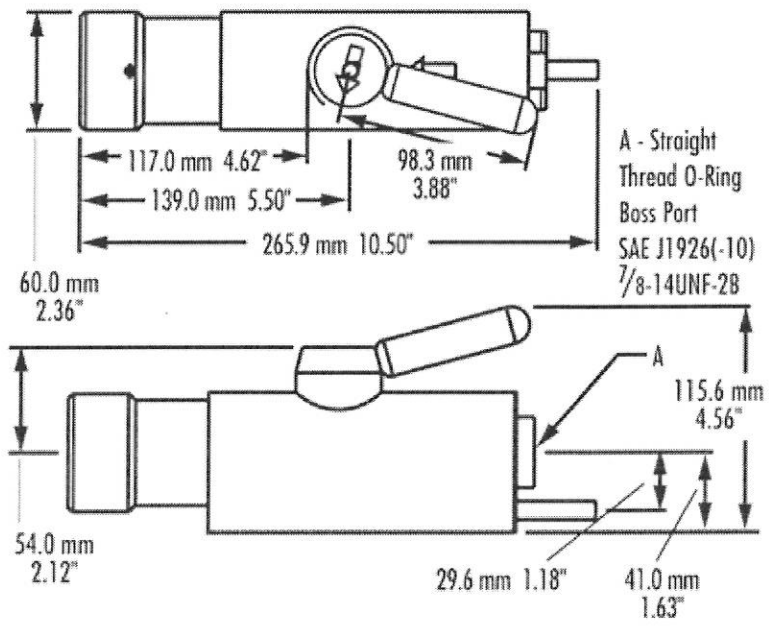
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Product No.	Inlet Thread Size	Maximum Allowable Service Pressure
CC5000S (non-directed vent)	SAE - 10, 7/8 - 14 UNF	3600 psi (248 Bar)
CT5000S (directed vent)	SAE - 10, 7/8 - 14 UNF	3600 psi (248 Bar)
A152	5000 Stainless Steel Jaw Replacement Kit	

- Connects to CL50 Series Heavy-Duty Receptacles

### Dimensions

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### **OPW In-Line Breakaway (ILB-5) - Heavy-Duty Truck/B (ILB-5)**



OPW has developed an in-line breakaway that can be used in heavy-duty truck and bus NGV refueling applications. This unit will function consistently, independent of the inlet pressure.

#### **Table of Contents:**

1. Features
2. Ordering Specifications

**Features:**

---

- Durable, Corrosion-Resistant Construction - Stainless steel and specially plated steel construction provide improved durability and corrosion resistance in harsh environments.
- Reconnectable Design - Allows the component to be reused, reducing maintenance costs.
- Innovative Valve System - The sealing system in this breakaway minimizes the amount of vent gas released during a drive-away incident.
- High Flow/Super Fast Fill Capacity - This is OPW's fastest flowing breakaway. This breakaway will provide quick fueling of large storage vehicles. Internal seals are specifically designed to meet the demands of fast-fill NGV fueling.
- Easy Installation - The in-line breakaway has SAE-10 O-ring fittings for easy installation in line between the dispenser and nozzle.
- Individually Inspected, Leak and Breakaway Tested, with Traceable Serial Numbers.
- Disconnection Force - 150 lbs. (668 N).

**Materials:**

Body: Stainless Steel

Internal Components: Stainless Steel

Seal: Specially formulated polymers and elastomers specific to high pressure NGV applications.

**Agency Listings: Pending**

### Specifications:

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Min. Flow Rate: 5500 SCFM @ 3000 psid  
Temperature Range: -40° C to 85° C  
(-40° F to 185° F)

Weight: 5 lbs.

Cv: 3.6

Design Pressure: 5000 psi (345 Bar)

### Ordering Information

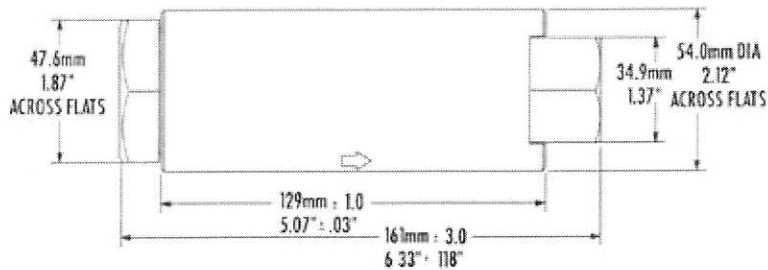
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Product No.	Inlet Thread Size	Outlet Thread Size	Max. Allowable Service Pressure
ILB-5	SAE - 10, 7/8 - 14 UNF (female)	SAE - 10, 7/8 - 14 UNF (female)	4500psi (310 Bar)
A155	ILB-5 Seal and Spring Replacement Kit		

- Recommended to be used with the CT5000S and CC6000 Series Heavy-Duty CNG Nozzles

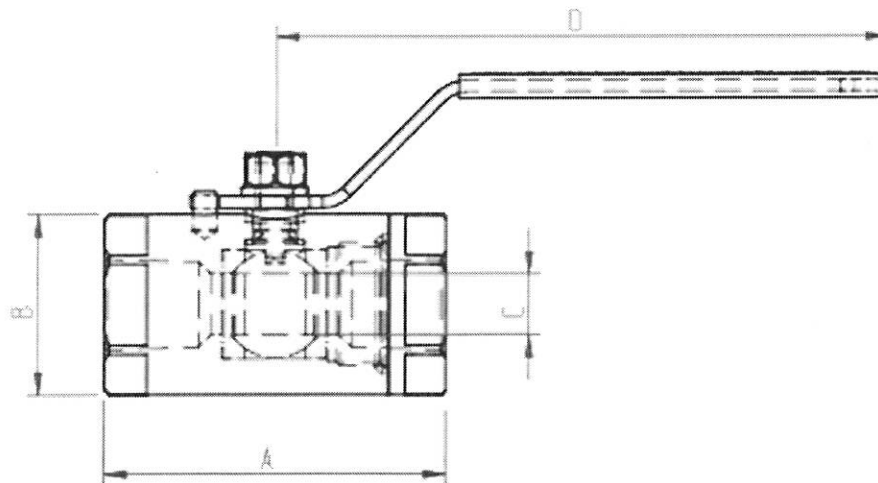
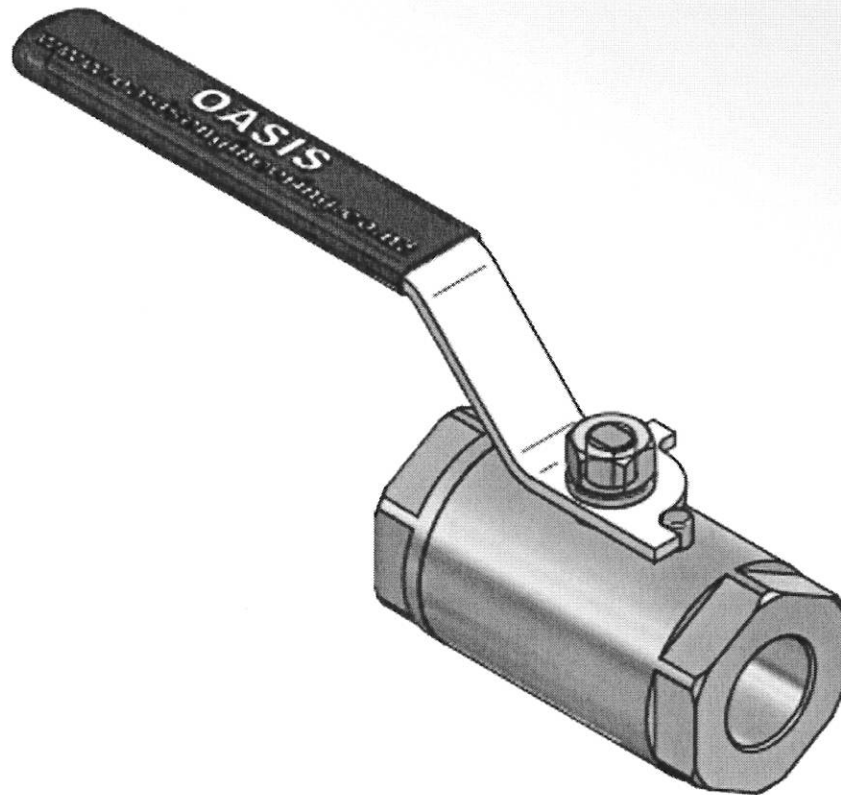
### ILB-5

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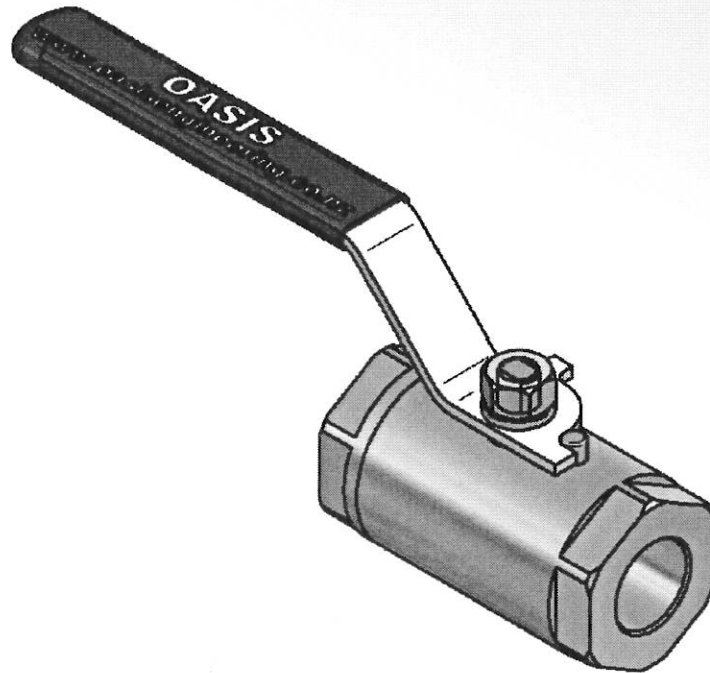








Sizes				
Item Code	A (mm)	B (mm)	C (mm)	D (mm)
BV704	73	38	13	130
BV706	100	55	20	177
BV708	108	69	26	177



#### Duty:

The 700 series ball valve is an all stainless steel bar stock two-piece serviceable valve. An anti-blowout stem design allows for high pressure operation in long term service. Fully CNC machined seats ensure minimal but even seat wear. Superior materials and finishes are used resulting in very long valve life even in rapid repetitive cycle applications. Service kits are readily available. This series of valves are rated and safety tested at four times working pressures.

#### Applications:

Natural Gas, Compress Air, Water Treatment, Chemical Handling, Liquid Petroleum Gas, Temperature Rated Food Handling.

Working Pressure: 6,000 psi  
Burst Pressure: 24,000 psi

#### Thread Options:

- SAE
- NPT
- BSP
- Or as required by customer

#### Components

Component Name	Material Standard
Body	316 Stainless steel
Cap	316 Stainless steel
Stem	316 Stainless steel
Ball	316 Stainless steel
Seat	Delrin AF
Thrust washer	Delrin AF
Stem o-ring	Nitrile
Cap o-ring	Nitrile

#### Sizes

Item Code	Nominal Size
BV704	12mm
BV706	20mm
BV708	25mm

# Bleed Valves

## Introduction

Parker BV Series Bleed Valves are designed for use on products such as multi-valve manifolds or gauge/root valves. Functionally, the valve vents line pressure either to atmosphere or to containment when used with the optional barbed vent tube. Generally, bleed valves are used whenever an instrument is removed from a system or to assist in the calibration of control devices. The BV Series is also recommended for use in bleeding hydraulic systems.

## Features

- Available in stainless steel, carbon steel and Alloy N24135
- Vent tube directs excess gas or liquid from system lines
- Chrome plated stem provides extended cycle life with improved sealability
- Positive stop/vent tube design prevents accidental removal of the stem
- Compact design
- Wrench actuation
- Available in a variety of end configurations including male pipe and SAE ports
- 100% factory tested
- Barbed vent tube option enables containment of vented media
- Optional T-bar handle for wrench-less actuation

## Specifications

### Pressure Rating:

10,000 psig (689 bar) CWP

### Temperature Rating:

#### Stainless Steel:

-65 °F to 850 °F (-54 °C to 454 °C)

#### Carbon Steel:

-20 °F to 450 °F (-29 °C to 232 °C)

#### Alloy N24135 (400):

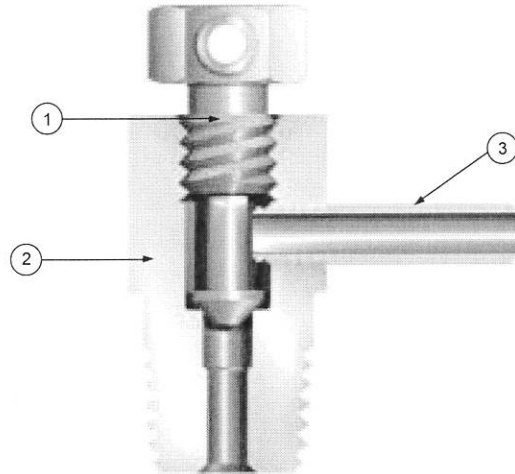
-65 °F to 500 °F (-54 °C to 260 °C)

## Flow Data

$C_v = 0.13$ ;  $x_T = 0.53$ ; Orifice = 0.125" (3.2mm).  
Tested in accordance with ISA S75.02. Gas flow will be choked when  $P_1 - P_2 / P_1 = x_T$ .

## Caution

These valves do not have a stem seal. It is imperative to open the valve slowly and direct the vent tube away from persons operating or near the valve. Because of the absence of a stem seal, small amounts of media will flow through the stem thread area when the valves are opened.



Model Shown: 4M-BV4-SS

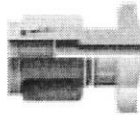
## Materials of Construction

Item #	Part	Stainless Steel	Carbon Steel	Alloy 400
1	Stem	ASTM A 479, Type 316		ASTM B 164
2	Valve Body	ASTM A 479, Type 316	ASTM A 108, Grade 12L14	ASTM B 164
3	Vent Tube	316 SS		ASTM B 164

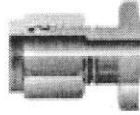
Lubrication: Molybdenum disulfide with soft metallic fillers

## Available Purge Valve End Connections

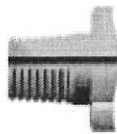
Z-Single ferrule CPI™  
compression port



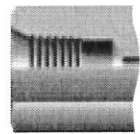
A-Two ferrule A-LOK®  
compression port



M-ANSI/ASME B1.20.1,  
External pipe threads



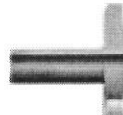
F-ANSI/ASME B1.20.1,  
Internal pipe threads



F5-SAE J1926/2 Part 2:  
Heavy-duty (S Series)  
stud ends



TA-Tube adapter  
connection



## Introduction

Parker PG Series Purge Valves may be utilized as either bleed, purge, or drain valves. The compact valve requires only a quarter turn with a wrench from finger-tight to ensure a leak-tight seal on the first make-up. Additional wrenching ensures a leak-tight seal up to the rated pressure.

## Features

- A 0.055 inch (1.4 mm) diameter vent hole in the cap bleeds, drains, or purges system pressure
- Hex cap permits finger-tight or wrench assisted closure
- Crimped cap resists accidental disassembly
- A variety of body styles offers system design flexibility, reduced space requirements, and helps to eliminate leak paths
- Available in a variety of end configurations including: CPI™, A-LOK®, male and female NPT, SAE, and Tube Adapter connections
- 100% factory tested
- Optional PTFE Ball requires only finger-tight torque to achieve a leak-tight seal

## Specifications

### Temperature Rating:

Stainless Steel:

-65 °F to 600 °F (-54 °C to 316 °C)

Brass:

-65 °F to 400 °F (-54 °C to 204 °C)

Carbon Steel:

-20 °F to 350 °F (-29 °C to 177 °C)

PTFE Ball Option:

-65 °F to 350 °F (-54 °C to 177 °C)

### Pressure Rating:

Stainless Steel: 4000 psig (276 bar) CWP

Brass: 3000 psig (207 bar)

Carbon Steel: 3000 psig (207 bar)

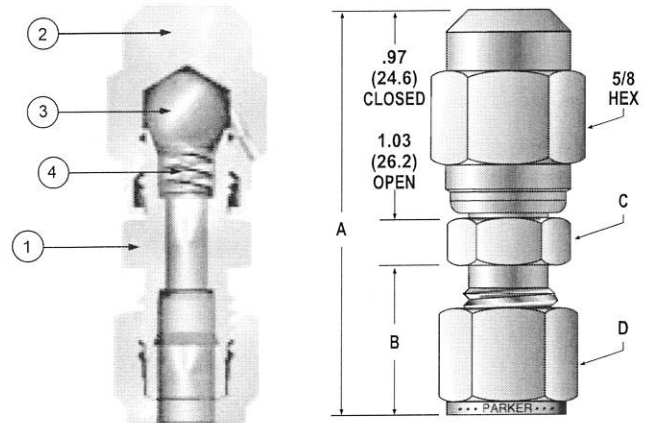
PTFE Ball Option: 200 psig (14 bar)

## Caution

These valves do not have a cap thread seal. It is imperative to open the valve slowly and direct the vent hole away from persons operating or near the valve. Because of the absence of a cap seal, small amounts of media will flow through the cap thread area when the valves are opened.

### PTFE Ball Option

Purge Valves with the PTFE ball option require only finger-tight operation for leak-tight shut-off and are designed with a removable cap for ball replacement.



Models Shown: 4Z-PG4L-SS

( ) Denotes dimensions in millimeters

## Materials of Construction

Item #	Part	Stainless Steel	Brass	Carbon Steel
1	Body	ASTM A 479, Type 316	ASTM B 16, Alloy C36000	ASTM A 108, Grade 12L14
2	Cap	ASTM A 479, Type 316	ASTM B 16, Alloy C36000	ASTM A 108, Grade 12L14
3	Ball	316 Stainless Steel*		
4	Spring	316 Stainless Steel		

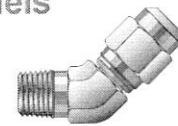
\* Optional PTFE Ball available

Lubrication: Molybdenum disulfide with soft metallic fillers

## Available Purge Valve Models



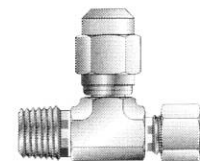
Straight (L)



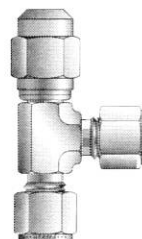
45° Elbow (E)



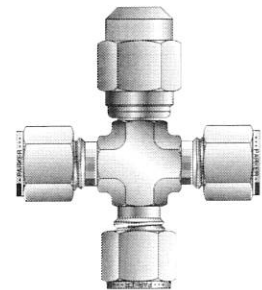
90° Elbow (A)



Inline Tee (TL)



Angle Tee (TA)



Union (U)

# Purge Valves

## Dimensions

End Connections	A* (Closed)		B*		C (hex)		D (hex)	
	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2A - 1/8" A-LOK® Compression	1.79	45.5	0.60	15.2	0.50	12.7	0.44	11.2
2Z - 1/8" CPI™ Compression	1.79	45.5	0.60	15.2	0.50	12.7	0.44	11.2
2M - 1/8" Male NPT	1.56	39.6	0.38	9.7	0.50	12.7	-	-
2F - 1/8" Female NPT	1.50	38.1	0.53	13.5	0.56	14.2	-	-
2TA - 1/8" Tube Adapter	1.69	42.9	0.55	14.0	0.50	12.7	-	-
4A - 1/4" A-LOK® Compression	1.88	47.8	0.70	17.8	0.50	12.7	0.56	14.2
4Z - 1/4" CPI™ Compression	1.88	47.8	0.70	17.8	0.50	12.7	0.56	14.2
4M - 1/4" Male NPT	1.76	44.7	0.56	14.2	0.56	14.2	-	-
4F - 1/4" Female NPT	1.69	42.9	0.72	18.3	0.75	19.1	-	-
4F5 - 1/4" Male SAE	1.78	45.2	0.41	10.4	0.75	19.1	-	-
4TA - 1/4" Tube Adapter	1.91	48.5	0.72	18.3	0.50	12.7	-	-
6A - 3/8" A-LOK® Compression	1.98	50.3	0.76	19.3	0.63	16.0	0.69	17.5
6Z - 3/8" CPI™ Compression	1.98	50.3	0.76	19.3	0.63	16.0	0.69	17.5
6M - 3/8" Male NPT	1.78	45.2	0.56	14.2	0.69	17.5	-	-
6F - 3/8" Female NPT	1.75	44.5	0.78	19.8	0.88	22.4	-	-
6TA - 3/8" Tube Adapter	1.97	50.0	0.78	19.8	0.50	12.7	-	-
M6A - 6mm A-LOK® Compression	1.88	47.8	0.70	17.8	0.55	14.0	0.55	14.0
M6Z - 6mm CPI™ Compression	1.88	47.8	0.70	17.8	0.55	14.0	0.55	14.0
8A - 1/2" A-LOK® Compression	2.12	53.8	0.87	22.1	0.81	20.6	0.88	22.4
8Z - 1/2" CPI™ Compression	2.12	53.8	0.87	22.1	0.81	20.6	0.88	22.4
8M - 1/2" Male NPT	2.03	51.6	0.75	19.1	0.88	22.4	-	-
8F - 1/2" Female NPT	1.94	49.3	0.97	24.6	1.06	26.9	-	-
8F5 - 1/2" Male SAE	2.08	52.8	0.47	11.9	1.13	28.7	-	-
8TA - 1/2" Tube Adapter	2.22	56.4	1.03	26.2	0.56	14.2	-	-
M8A - 8mm A-LOK® Compression	1.97	50.0	0.75	19.1	0.63	16.0	0.63	16.0
M8Z - 8mm CPI™ Compression	1.97	50.0	0.75	19.1	0.63	16.0	0.63	16.0

\* For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

## How to Order Purge Valves

The correct part number is easily derived from the following number sequence. The seven product characteristics required are coded as shown below. Note: If the ports are the same, only specify one end connection.

Example: 2M - PG4 A - SS - T

(1) (2) (3)      (4)      (5)      (6)      (7)

Describes a stainless steel, 90° angle body PG4 Purge Valve with a 1/8" male NPT port configuration and a PTFE Ball.

End Connection (1) (2) (3)	Valve Series (4)	Body Type (5)	Material (6)	Ball (7)
2A, 2Z, 2F, 2M, 2TA	PG4	L - Straight	SS - Stainless Steel	Blank - Stainless Steel
4A, 4Z, 4F, 4F5*, 4M, 4TA		A - 90° Elbow		
6A, 6Z, 6F, 6M 6TA, M6A, M6Z		E - 45° Elbow	B - Brass	
8A, 8Z, 8F, 8F5*, 8TA 8M, M8A, M8Z		TL - Tee with inline flow TA - Tee with angle flow U - Union	S - Carbon Steel	

\* NOTE: Male SAE port will be supplied with a fluorocarbon rubber O-ring seal by adding O after F5; i.e., 4F5O.  
Oxygen cleaning: Add the suffix -C3 to the end of the part number to receive valves cleaned for oxygen service per IVD Specification ES8003.

### ⚠ WARNING

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

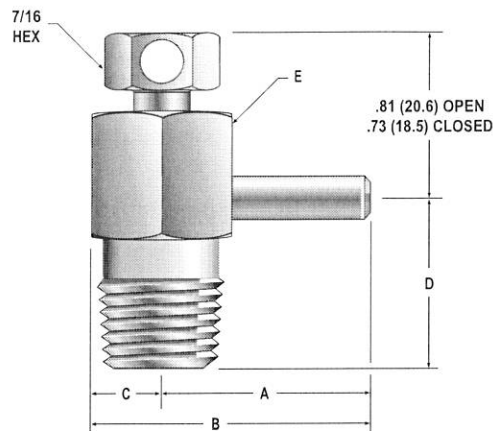
The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

### Offer of Sale

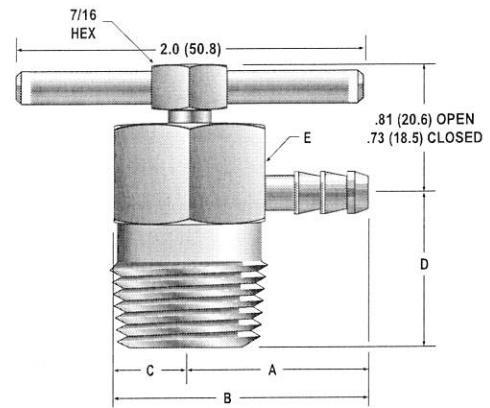
The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the "Offer of Sale" located in Catalog 4110-U Needle Valves (U Series).

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# Bleed Valves



Model Shown: 4M-BV4-SS



Model Shown: 8M-BV8-SS-BVT-T

( ) Denotes dimensions in millimeters

## Dimensions

Basic Part Number	Inlet	Outlet	Dimensions									
			A		B		C		D		E (hex)	
			Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm
2M-BV4	1/8" Male NPT	3/16" O.D. Tube	0.94	23.88	1.24	31.50	0.31	7.87	0.75	19.05	0.63	16.00
4M-BV4	1/4" Male NPT		0.94	23.88	1.24	31.50	0.31	7.87	0.75	19.05	0.63	16.00
4KM-BV4	1/4" Male BSP		0.94	23.88	1.24	31.50	0.31	7.87	0.75	19.05	0.63	16.00
4F5-BV4	1/4" Male SAE		0.94	23.88	1.24	31.50	0.31	7.87	0.69	17.53	0.63	16.00
6M-BV8	3/8" Male NPT	Stub	1.03	26.16	1.49	37.85	0.44	11.18	0.88	22.35	0.88	22.35
8M-BV8	1/2" Male NPT		1.03	26.16	1.49	37.85	0.44	11.18	0.88	22.35	0.88	22.35
8F5-BV8	1/2" Male SAE		1.03	26.16	1.49	37.85	0.44	11.18	0.88	22.35	0.88	22.35

## How to Order Bleed Valves

The correct part number is easily derived by following the circled number sequence. The five product characteristics required are coded as shown below.

Example: 4M - BV4 - SS - BVT - 5

Describes a stainless steel BV4 Bleed Valve with a 1/4" male NPT inlet and a barbed vent tube outlet.

End Connection ①	Valve Series ②	Material ③	Vent Selection ④	Handle Option ⑤
2M 4KM 4M 4F5*	BV4	SS - Stainless Steel S - Carbon Steel	Blank - Vent Tube BVT - Barbed Vent Tube	Blank - No Handle T - Tee Bar Handle
6M 8M 8F5*	BV8	M - Alloy N24135		

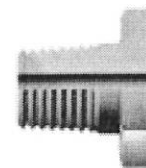
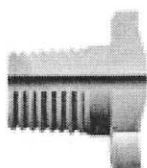
\* Note: Male SAE port will be supplied with a fluorocarbon rubber O-ring by adding O after F5; i.e., 4F5O.

## Available Bleed Valve End Connections

M-ANSI/ASME B1.20.1,  
External pipe threads

F5-SAE J1926/2 Part 2:  
Heavy-duty (S Series)  
stud ends

KM-British Standard  
BS21 (ISO 7-1),  
External pipe threads



**State of California**  
Department of Food and Agriculture  
Division of Measurement Standards

Certificate Number: 5438-05  
Page 1 of 3

***California Type Evaluation Program***  
***Certificate of Approval***  
***for Weighing and Measuring Devices***

**For:**

Compressed Natural Gas (CNG)  
Retail Motor Fuel Dispenser, Electronic  
Computing Model: TGT TXXXX-XCNG50-XX  
Series  
(See Model Designation)  
Capacity: Maximum Total Price: \$9999.99  
Maximum Total Volume: 999.999\*  
Maximum Unit Price: \$9.999

Accuracy Class: 2.0

**Submitted by:**

Tulsa Gas Technologies, Inc.  
4809 South 101st East  
Avenue Tulsa, OK 74146  
Tel: (918) 665-2641  
Fax: (918) 665-2657  
Contact: Charlie Sewell

**Standard Features and Options**

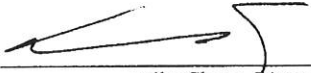
\* Gasoline gallon equivalent or gasoline liter equivalent

Flow rate from 4 lb to 53 lb per minute  
Computing register  
Micro Motion Model 2700 series transmitter  
Micro Motion Model CNG050 sensor  
Back-lit alphanumeric liquid crystal display  
Temperature compensation fill  
Dual hose and single hose design  
Design pressure: Maximum 5 000 PSI  
3/8" tubing

**Option:** Island card reader

This device was evaluated under the California Type Evaluation Program (CTEP) and was found to comply with the applicable technical requirements of California Code of Regulations for "Weighing and Measuring Devices." Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages.

Effective Date: August 26, 2005

  
\_\_\_\_\_  
Mike Cleary, Director



**Tulsa Gas Technologies, Inc.**  
**Compressed Natural Gas (CNG)**  
**Retail Motor Fuel dispenser, Electronic Computing**  
**Model: TGT TXXXX-XCNG50-XX Series**

**Application:** For use as a dispenser in retail motor fuel service stations for measuring CNG as an automotive fuel and may be used with approved and compatible island card reader.

**Identification:** The identification information is located on the lower side part of the cabinet near the hose breakaway.

**Model Designation:** TGT TXXXX-XCNG50-XX

TGT	T	X	X	X	X	X	CNG 50	XX
Basic model	T = Tulsa Electronics	6 = Low hose body 7 = High hose body 8 = High hose body	1 = One hose 2 = Two hoses	0 = One meter for each hose 1 = Single meter for dual hose	0 = No sequencmg, no temp comp 2 = Sequencing valves remote 3 = Sequencing valves in dispenser 4 = Temp comp only 5 = Sequencing for 2 or 1 hose w/1 meter 6 = Two bank sequencmg	6 = 3/8" tubing 8 = 1/2" 12 = 3/4" 16 = 1"	Meter type installed	Blank = Non-required CE = CENELEC W = Weights & Measures

**Sealing:** An EPROM containing the configuration parameters is mounted on the control electronics motherboard inside the control electronics enclosure. The control electronics enclosure is located behind the dispenser's customer display door (upper cabinet door). The EPROM must be removed and re-configured at the factory and is sealed in-place with a tamper sensitive paper seal. The-Micro Motion 2700 series transmitter is sealed in accordance with the sealing provisions of its certificate. The sensor has no components which require the use of a security seal.

**Operation:** Open the dispenser's customer display door and view the mass value (the default screen display) on the control electronics enclosure display. A keypad on the cover of the control electronics enclosure is used to access the version number and accumulated total values. From the default screen displaying the mass values:

Press 123 ENTER

Press 04 ENTER

Press 05 ENTER, the total values will be displayed on the control electronics enclosure display Press CANCEL to revert the display back to the default screen displaying the mass value

Press 123 ENTER

Press 05 ENTER

Press 04 ENTER, the version number will be displayed on the control electronics enclosure display Press CLEAR at any time to move back one screen

**Tulsa Gas Technologies, Inc.  
Compressed Natural Gas (CNG)  
Retail Motor Fuel dispenser, Electronic Computing  
Model: TGT TXXXX-XCNG50-XX Series**

**Test Conditions:** The Model TGT T8203-6CNG50-XX was submitted for a field evaluation. The dispenser was interfaced with a Multi Force Model FF814 card reader and Micro Motion mass flow metering system (2700 series transmitter with CNG050 sensor). The emphasis of the evaluation was on device design, performance, interaction with the card reader, and permanence. Initial tests were conducted at varying pressure ranges, delivery amounts, and several flow rates ranging from 4 lb/min up to 42 lb/min. Similar tests were repeated after approximately 45 days. Product throughput requirements were waived based on previous testing of the sensor and transmitter.

The results of the evaluation indicate the device complies with applicable requirements.

**Type Evaluation Criteria Used:** Title 4, California Code of Regulations, 2005 Edition

**Tested By:** R. Norman Ingram and Will Rickey





MERCER VALVE CO., INC.  
"AUTO SEAT TECHNOLOGY"®

# MERCER VALVE CO., INC.

## 1400 SERIES "B" ORIFICE SAFETY RELIEF VALVE

### INSTALLATION AND OPERATION INSTRUCTIONS

**INSTALLATION** - A safety relief valve should always be installed in a vertical position with its outlet pointing in a horizontal direction on a tank or piping system. When screwing the valve onto the system, always use a square jaw wrench on the designed wrenching flats located at the inlet of the valve, never on the valve's body or bonnet.

One of the most common causes of early failure of a relief valves is seat leakage caused by dirt/debris trapped on the valve seat. Welding slag and piping PTFE tape are among the more common items that cause difficulty. It is recommended that all piping and tank systems be cleaned prior to installation of the relief valve.

A relief valve mounted on a tank should be connected with the minimum length of piping between the tank and the valve. Further, all piping used must be equal or larger than the inlet pipe diameter size of the relief valve, never smaller. Any restriction of the inlet to a relief valve may cause unusual valve chatter or relief capacities below the design rating of the valve, which could result in serious damage. Similarly, outlet piping from the relief valve should be less than four (4) feet (1.2 m) in length and never of a pipe size diameter smaller than the outlet size of the relief valve. Long runs of small diameter pipe on the outlet of a relief valve will create a serious hazard to life and property. Larger piping is recommended to reduce the built-up back pressure.

**Extreme caution** is required in the outlet piping if installed outdoors where liquids, if present, could form an ice block in the outlet piping or in the valve's body. In below freezing weather, this will block/restrict flow. Discharge lines must be "weather capped" and provided with a drain hole to prevent any liquid collection in the relief valve body or outlet piping to prevent this.

Safety pressure relief valves must be braced and supported for reaction forces, vibrations, and other external forces applied to the valve in operation. Additionally, important installation factors are contained in paragraph UG-135 and Appendix M of Section VIII of the ASME Boiler and Pressure Vessel Code. If any of these precautions are not taken, serious damage and injury will result.

**OPERATION** - The valve's set pressure must not exceed the maximum working pressure of the vessel/system. Best performance is usually obtained by installing a valve on a system where the operating pressure is at least 15% less than the valve's set pressure. A greater margin of 20-30% is desirable.

It is also important to check that back pressure and temperature limitations of the process are consistent with valve's ratings. Built-up back pressure should not exceed the allowable overpressure for spring operated valves. Note that each seat and o-ring material has temperature/pressure limitations. Using these materials outside their limitations will cause the valve to fail. Contact Mercer Valve to find different material limitations.

Additionally, corrosion effects from the system's media need to be accounted for in the material selections/compatibilities of the valve's components. Proper material selection and designation is the responsibility of the user/purchaser of the valve. Extra care in material selection must be taken in applications that affect the materials of the valve like Hydrogen service. Standard materials are not acceptable in these types of applications. Contact Mercer Valve Engineering for potential alternative materials.

Carefully check the maximum process fluid input capacities to insure that the valve's relieving capacity is greater than the process's capability. It is important that the intended service (gas/liquid) of the valve is installed on a system with same service.

**MAINTENANCE & INSPECTION** - Mercer Valve Co. recommends all of its pressure relief valves to be tested annually for set point and function. During these intervals, a visual inspection, set pressure test, and leak check should be done on the valve. All Mercer Safety Relief Valves are leak check to at least 90% of set pressure. All inspections and repairs should be done by an authorized and trained professional who has a VR certification.

**DO NOT BREAK THE SEAL WIRE.** To do so invalidates the manufacturer's warranty to repair or replace the valve. Should resetting be required in a field emergency situation, it should be performed by qualified personnel with calibrated instrumentation. Note that the Section VIII of the ASME Boiler and Pressure Vessel Code specifies that valves should only be reset within the installed spring's set pressure range which is specified by the manufacturer. Consult factory for additional resetting information.

**WARRANTY** - Mercer Valve warrants the goods delivered hereunder to be free from defects in material and workmanship, under normal use and service, for a period of one (1) year after date of shipment. Mercer's obligation under this warranty is limited to repair or replacement at Mercer's sole option, of any defective item. Mercer's liability under this warranty is conditioned upon Purchaser giving Mercer immediate written notice of any such defect. Mercer shall have the option of requiring the return of the defective item, transportation prepaid, to establish the claim. Any repair or replacement of defective goods or parts will occur at Mercer's plant in Oklahoma City, Oklahoma. Purchaser shall bear all freight costs incurred in transporting defective goods or parts to and from Mercer's plant. Mercer shall not be held liable for damages caused by delays in repair or replacement of any defective items. The provisions in the Mercer literature and specifications are descriptive only, unless expressly stated as warranties. EXCEPT FOR THE FOREGOING, MERCER EXPRESSLY DISCLAIMS ALL WARRANTIES, EXPRESS AND IMPLIED INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Mercer's liability to the Purchaser, arising out of the supplying of the said goods or their use, whether based upon warranty, contract or negligence, shall not in any case exceed the cost of correcting defects in, or replacing, the equipment as herein provided. Upon the expiration of said one (1) year, all such liability shall terminate. Mercer shall not in any event be held liable for any special, indirect, or consequential damages. SUITABILITY OF THE MATERIAL AND PRODUCT FOR THE USE CONTEMPLATED BY THE BUYER IS THE SOLE RESPONSIBILITY OF THE BUYER.

*Consult the Installation, Operation, and Maintenance Manual for additional information.*

MERCER VALVE CO., INC.  
9609 NW 4<sup>TH</sup> STREET, OKLAHOMA CITY, OK 73127  
PHONE: (405) 495-6533 • FAX: (405) 495-8728 • 1-800-833-6402  
[www.mercervalve.net](http://www.mercervalve.net)

**THINK...MERCER FIRST™**



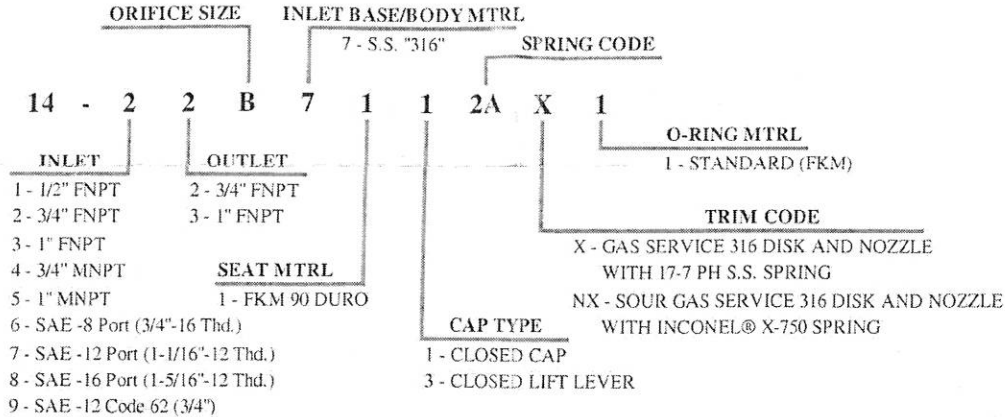
**MERCER VALVE CO., INC.**  
"AUTO SEAT TECHNOLOGY"®

# 1400 SERIES SAFETY RELIEF VALVES

Mercer Valve 1400 Series Safety Relief Valves are the "State of the Art" in soft seat, high flow rate, pressure relief devices. This unique design concept provides the user with the following advantages:

- HIGH FLOW RATES
- PREMIUM QUALITY
- LOW COST
- EXTENDED SEAT LIFE
- REPEATABLE SET PRESSURE
- OPEN, CLOSE, SEAT AND SEAL™

All 1400 Series Valves are built in accordance with the requirements of the ASME Boiler and Pressure Vessel Code Section VIII, Division 1. Capacity ratings were established by testing performed at the National Board of Boiler and Pressure Vessel Inspectors in Columbus, Ohio.



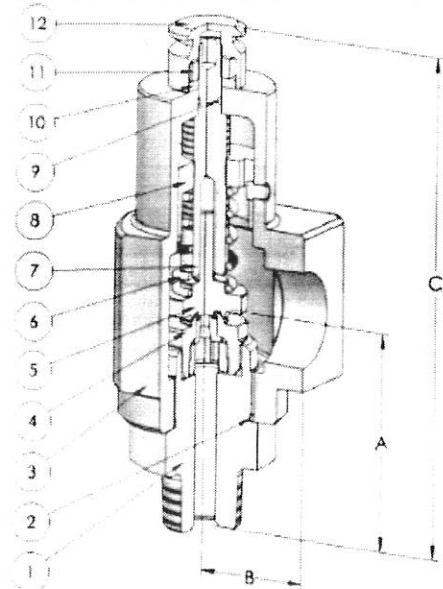
*Other company names and product names used in this document are registered trademarks or tradenames of their respective owners.*

## SPECIFICATIONS

Inlet Valve Size: in (DN)	1/2, 3/4, 1 (15,20,25)
Outlet Size: in (DN)	3/4, 1 (20,25)
Orifice Diameter in (mm):	0.160 (4.1)
Orifice Area in <sup>2</sup> (mm <sup>2</sup> ):	0.020 (12.9)
Pressure Ranges psig (kPag):	500 to 6000 (3447 to 41368)
Standard Temp. Range °F (°C):	-20 to 400 (-28.9 to 204.4)
ASME Gas Flow Coefficient (90%):	0.7937
ASME Slope (90%):	0.291
Approx. Weight lbm (kg):	4.5 (2.04)

## PARTS AND MATERIALS

ITEM NO	PART NAME	STANDARD MATERIALS
1	INLET BASE	316 STAINLESS STEEL
2	O-RING	90 DURO FLUOROCARBON
3	BODY SUBASSEMBLY	316 STAINLESS STEEL
4	NOZZLE SUBASSEMBLY	316 STAINLESS STEEL WITH SOFT SEAT
5	DISK	316 STAINLESS STEEL
6	SPRING	17-7 PH STAINLESS STEEL
7	ADJUSTMENT SCREW	316 STAINLESS STEEL
8	ASDJUSTMENT BUSHING	316 STAINLESS STEEL
9	O-RING	90 DURO FLUOROCARBON
10	WASHER	316 STAINLESS STEEL
11	LOCKNUT	316 STAINLESS STEEL
12	CLOSED CAP	316 STAINLESS STEEL





## Parker Safety Guide for Selecting and Using Hose, Tubing, Fittings and Related Accessories

Parker Publication No. 4400-B.1  
Revised: May, 2002

**WARNING:** Failure or improper selection or improper use of hose, tubing, fittings, assemblies or related accessories ("Products") can cause death, personal injury and property damage. Possible consequences of failure or improper selection or improper use of these Products include but are not limited to:

- Fittings thrown off at high speed.
- High velocity fluid discharge.
- Explosion or burning of the conveyed fluid.
- Electrocutation from high voltage electric powerlines.
- Contact with suddenly moving or falling objects that are controlled by the conveyed fluid.
- Injections by high-pressure fluid discharge.
- Dangerously whipping Hose.
- Contact with conveyed fluids that may be hot, cold, toxic or otherwise injurious.
- Sparking or explosion caused by static electricity buildup or other sources of electricity.
- Sparking or explosion while spraying paint or flammable liquids.
- Injuries resulting from inhalation, ingestion or exposure to fluids.

Before selecting or using any of these Products, it is important that you read and follow the instructions below. Only Hose from Parker's Stratoflex Products Division is approved for in flight aerospace applications, and no other Hose can be used for such in flight applications.

### 1.0 GENERAL INSTRUCTIONS

- 1.1 **Scope:** This safety guide provides instructions for selecting and using (including assembling, installing, and maintaining) these Products. For convenience, all rubber and/or thermoplastic products commonly called "hose" or "tubing" are called "Hose" in this safety guide. All assemblies made with Hose are called "Hose Assemblies". All products commonly called "fittings" or "couplings" are called "Fittings". All related accessories (including crimping and swaging machines and tooling) are called "Related Accessories". This safety guide is a supplement to and is to be used with, the specific Parker publications for the specific Hose, Fittings and Related Accessories that are being considered for use.
- 1.2 **Fail-Safe:** Hose, and Hose Assemblies and Fittings can and do fail without warning for many reasons. Design all systems and equipment in a fail-safe mode, so that failure of the Hose or Hose Assembly or Fitting will not endanger persons or property.
- 1.3 **Distribution:** Provide a copy of this safety guide to each person that is responsible for selecting or using Hose and Fitting products. Do not select or use Parker Hose or Fittings without thoroughly reading and understanding this safety guide as well as the specific Parker publications for the products considered or selected.
- 1.4 **User Responsibility:** Due to the wide variety of operating conditions and applications for Hose and Fittings, Parker and its distributors do not represent or warrant that any particular Hose or Fitting is suitable for any specific end use system. This safety guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
- Making the final selection of the Hose and Fitting.
  - Assuring that the user's requirements are met and that the application presents no health or safety hazards.
  - Providing all appropriate health and safety warnings on the equipment on which the Hose and Fittings are used.
  - Assuring compliance with all applicable government and industry standards.
- 1.5 **Additional Questions:** Call the appropriate Parker technical service department if you have any questions or require any additional information. See the Parker publication for the product being considered or used, or call 1-800-CPARKER, or go to [www.parker.com](http://www.parker.com), for telephone numbers of the appropriate technical service department.

### 2.0 HOSE AND FITTING SELECTION INSTRUCTIONS

- 2.1 **Electrical Conductivity:** Certain applications require that the Hose be nonconductive to prevent electrical current flow. Other applications require the Hose and the Fitting and the Hose/Fitting interface to be sufficiently conductive to drain off static electricity. Extreme care must be exercised when selecting Hose and Fittings for these or any other applications in which electrical conductivity or nonconductivity is a factor. The electrical conductivity or nonconductivity of Hose and Fittings is dependent upon many factors and may be susceptible to change. These factors include but are not limited to the various materials used to make the Hose and the Fittings, Fitting finish (some Fitting finishes are electrically conductive while others are nonconductive), manufacturing methods (including moisture control), how the Fittings contact the Hose, age and amount of deterioration or damage or other changes, moisture content of the Hose at any particular time, and other factors. The following are considerations for electrically nonconductive and conductive Hose. For other applications consult the individual catalog pages and the appropriate industry or regulatory standards for proper selection.
- 2.1.1 **Electrically Nonconductive Hose:** Certain applications require that the Hose be nonconductive to prevent electrical current flow or to maintain electrical isolation. For these applications that require Hose to be electrically nonconductive, including but not limited to applications near high voltage electric lines, only special nonconductive Hose can be used. The manufacturer of the equipment in which the nonconductive Hose is to be used must be consulted to be certain that the Hose and Fittings that are selected are proper for the application. Do not use any Parker Hose or Fitting for any such application requiring nonconductive Hose, including but not limited to applications near high voltage electric lines, unless (i) the application is expressly approved in the Parker technical publication for the product, (ii) the Hose is marked "nonconductive", and (iii) the manufacturer of the equipment on which the Hose is to be used specifically approves the particular Parker Hose and Fitting for such use.
- 2.1.2 **Electrically Conductive Hose:** Parker manufactures special Hose for certain applications that require electrically conductive Hose. Parker manufactures special Hose for conveying paint in airless paint spraying applications. This Hose is labeled "Electrically Conductive Airless Paint Spray Hose" on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in all airless paint spraying applications. Do not use any other Hose for airless paint spraying, even if electrically conductive. Use of any other Hose or failure to properly connect the Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. Parker manufactures a special Hose for certain compressed natural gas ("CNG") applications where static electricity buildup may occur. Parker CNG Hose assemblies comply with AGA Requirements 1-93, "Hoses for Natural Gas Vehicles and Fuel Dispensers". This Hose is labeled "Electrically Conductive for CNG Use" on its layline and packaging. This Hose must be properly connected to the appropriate Parker Fittings and properly grounded in order to dissipate dangerous static charge buildup, which occurs in, for example, high velocity CNG dispensing or transfer. Do not use any other Hose for CNG applications where static charge buildup may occur, even if electrically conductive. Use of other Hoses in CNG applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. Care must also be taken to protect against CNG permeation through the Hose wall. See section 2.6, Permeation, for more information. Parker CNG Hose is intended for dispenser and vehicle use at a maximum temperature of 180°F. Parker CNG Hose should not be used in confined spaces or unventilated areas or areas exceeding 180°F. Final assemblies must be tested for leaks. CNG Hose Assemblies should be tested on a monthly basis for conductivity per AGA 1-93. Parker manufactures special Hose for aerospace in flight applications. Aerospace in flight applications employing Hose to transmit fuel, lubricating fluids and hydraulic fluids require a special Hose with a conductive inner tube. This Hose for in flight applications is available only from Parker's Stratoflex Products Division. Do not use any other Parker Hose for in flight applications, even if electrically conductive. Use of other Hoses for in flight applications or failure to properly connect or ground this Hose can cause a fire or an explosion resulting in death, personal injury, and property damage. These Hose assemblies for in flight applications must meet all applicable aerospace industry, aircraft engine, and aircraft requirements.
- 2.2 **Pressure:** Hose selection must be made so that the published maximum recommended working pressure of the Hose is equal to or greater than the maximum system pressure. Surge pressures or peak transient pressures in the system must be below the published maximum working pressure for the Hose. Surge pressures and peak pressures can usually only be determined by sensitive electrical instrumentation that measures and indicates pressures at millisecond intervals. Mechanical pressure gauges indicate only average pressures and cannot be used to determine surge pressures or peak transient pressures. Published burst pressure ratings for Hose is for manufacturing test purposes only and is no indication that the Product can be used in applications at the burst pressure or otherwise above the published maximum recommended working pressure.
- 2.3 **Suction:** Hoses used for suction applications must be selected to insure that the Hose will withstand the vacuum and pressure of the system. Improperly selected Hose may collapse in suction application.
- 2.4 **Temperature:** Be certain that fluid and ambient temperatures, both steady and transient, do not exceed the limitations of the Hose. Temperatures below and above the recommended limit can degrade Hose to a point where a failure may occur and release fluid. Properly insulate and protect the Hose Assembly when routing near hot objects (e.g. manifolds). Do not use any Hose in any application where failure of the Hose could result in the conveyed fluids (or vapors or mist from the conveyed fluids) contacting any open flame, molten metal, or other potential fire ignition source that could cause burning or explosion of the conveyed fluids or vapors.
- 2.5 **Fluid Compatibility:** Hose Assembly selection must assure compatibility of the Hose tube, cover, reinforcement, and Fittings with the fluid media used. See the fluid compatibility chart in the Parker publication for the product being considered or used. This information is offered only as a guide. Actual service life can only be determined by the end user by testing under all extreme conditions and other analysis. Hose that is chemically compatible with a particular fluid must be assembled using Fittings and adapters containing likewise compatible seals.
- 2.6 **Permeation:** Permeation (that is, seepage through the Hose) will occur from inside the Hose to outside when Hose is used with gases, liquid and gas fuels, and refrigerants (including but not limited to such materials as helium, diesel fuel, gasoline, natural gas, or LPG). This permeation may result in high concentrations of vapors which are potentially flammable, explosive, or toxic, and in loss of fluid. Dangerous explosions, fires, and other hazards can result when using the wrong Hose for such applications. The system designer must take into account the fact that this permeation will take place and must not use Hose if this permeation could be hazardous. The system designer must take into account all legal, government, insurance, or any other special regulations which govern the use of fuels and refrigerants. Never use a Hose even though the fluid compatibility is acceptable without considering the potential hazardous effects that can result from permeation through the Hose Assembly. Permeation of moisture from outside the Hose to inside the Hose will also occur in Hose assemblies, regardless of internal pressure. If this moisture permeation would have detrimental effects (particularly, but not limited to refrigeration and air conditioning systems), incorporation of sufficient drying capacity in the system or other appropriate system safeguards should be selected and used.
- 2.7 **Size:** Transmission of power by means of pressurized fluid varies with pressure and rate of flow. The size of the components must be adequate to keep pressure losses to a minimum and avoid damage due to heat generation or excessive fluid velocity.
- 2.8 **Routing:** Attention must be given to optimum routing to minimize inherent problems (kinking or flow restriction due to Hose collapse, twisting of the Hose, proximity to hot objects or heat sources).
- 2.9 **Environment:** Care must be taken to insure that the Hose and Fittings are either compatible with or protected from the environment (that is, surrounding conditions) to which they are exposed. Environmental conditions including but not limited to ultraviolet radiation, sunlight, heat, ozone, moisture, water, salt water, chemicals, and air pollutants can cause degradation and premature failure.
- 2.10 **Mechanical Loads:** External forces can significantly reduce Hose life or cause failure. Mechanical loads which must be considered include excessive flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Use of swivel type Fittings or adapters may be required to insure no twist is put into the Hose. Unusual applications may require special testing prior to Hose selection.

(OVER)

- 2.11 **Physical Damage:** Care must be taken to protect Hose from wear, snagging, kinking, bending smaller than minimum bend radius, and cutting, any of which can cause premature Hose failure. Any Hose that has been kinked or bent to a radius smaller than the minimum bend radius, and any Hose that has been cut or is cracked or is otherwise damaged, should be removed and discarded.
- 2.12 **Proper End Fitting:** See instructions 3.2 through 3.5. These recommendations may be substantiated by testing to industry standards such as SAE J517 for hydraulic applications, or MIL-A-5070, AS1339, or AS3517 for Hoses from Parker's Stratoflex Products Division for aerospace applications.
- 2.13 **Length:** When establishing a proper Hose length, motion absorption, Hose length changes due to pressure, and Hose and machine tolerances and movement must be considered.
- 2.14 **Specifications and Standards:** When selecting Hose and Fittings, government, industry, and Parker specifications and recommendations must be reviewed and followed as applicable.
- 2.15 **Hose Cleanliness:** Hose components may vary in cleanliness levels. Care must be taken to insure that the Hose Assembly selected has an adequate level of cleanliness for the application.
- 2.16 **Fire Resistant Fluids:** Some fire resistant fluids that are to be conveyed by Hose require use of the same type of Hose as used with petroleum base fluids. Some such fluids require a special Hose, while a few fluids will not work with any Hose at all. See instructions 2.5 and 1.5. The wrong Hose may fail after a very short service. In addition, all liquids but pure water may burn fiercely under certain conditions, and even pure water leakage may be hazardous.
- 2.17 **Radiant Heat:** Hose can be heated to destruction without contact by such nearby items as hot manifolds or molten metal. The same heat source may then initiate a fire. This can occur despite the presence of cool air around the Hose.
- 2.18 **Welding or Brazing:** When using a torch or arc-welder in close proximity to hydraulic lines, the hydraulic lines should be removed or shielded with appropriate fire resistant materials. Flame or weld spatter could burn through the Hose and possibly ignite escaping fluid resulting in a catastrophic failure. Heating of plated parts, including Hose Fittings and adapters, above 450°F (232°C) such as during welding, brazing, or soldering may emit deadly gases.
- 2.19 **Atomic Radiation:** Atomic radiation affects all materials used in Hose assemblies. Since the long-term effects may be unknown, do not expose Hose assemblies to atomic radiation.
- 2.20 **Aerospace Applications:** The only Hose and Fittings that may be used for in flight aerospace applications are those available from Parker's Stratoflex Products Division. Do not use any other Hose or Fittings for in flight applications. Do not use any Hose or Fittings from Parker's Stratoflex Products Division with any other Hose or Fittings, unless expressly approved in writing by the engineering manager or chief engineer of Stratoflex Products Division and verified by the user's own testing and inspection to aerospace industry standards.
- 2.21 **Unlocking Couplings:** Ball locking couplings or other couplings with disconnect sleeves can unintentionally disconnect if they are dragged over obstructions or if the sleeve is bumped or moved enough to cause disconnect. Threaded couplings should be considered where there is a potential for accidental uncoupling.
- 3.0 HOSE AND FITTING ASSEMBLY AND INSTALLATION INSTRUCTIONS**
- 3.1 **Component Inspection:** Prior to assembly, a careful examination of the Hose and Fittings must be performed. All components must be checked for correct style, size, catalog number, and length. The Hose must be examined for cleanliness, obstructions, blisters, cover looseness, kinks, cracks, cuts or any other visible defects. Inspect the Fitting and sealing surfaces for burrs, nicks, corrosion or other imperfections. Do NOT use any component that displays any signs of nonconformance.
- 3.2 **Hose and Fitting Assembly:** Do not assemble a Parker Fitting on a Parker Hose that is not specifically listed by Parker for that Fitting, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division. Do not assemble a Parker Fitting on another manufacturer's Hose or a Parker Hose on another manufacturer's Fitting unless (i) the engineering manager or chief engineer of the appropriate Parker division approves the Assembly in writing or that combination is expressly approved in the appropriate Parker literature for the specific Parker product, and (ii) the user verifies the Assembly and the application through analysis and testing. For Parker Hose that does not specify a Parker Fitting, the user is solely responsible for the selection of the proper Fitting and Hose Assembly procedures. See instruction 1.4. The Parker published instructions must be followed for assembling the Fittings on the Hose. These instructions are provided in the Parker Fitting catalog for the specific Parker Fitting being used, or by calling 1-800-CPARKER, or at www.parker.com.
- 3.3 **Related Accessories:** Do not crimp or swage any Parker Hose or Fitting with anything but the listed swage or crimp machine and dies in accordance with Parker published instructions. Do not crimp or swage another manufacturer's Fitting with a Parker crimp or swage die unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.
- 3.4 **Parts:** Do not use any Parker Fitting part (including but not limited to socket, shell, nipple, or insert) except with the correct Parker mating parts, in accordance with Parker published instructions, unless authorized in writing by the engineering manager or chief engineer of the appropriate Parker division.
- 3.5 **Reusable/Permanent:** Do not reuse any field attachable (reusable) Hose Fitting that has blown or pulled off a Hose. Do not reuse a Parker permanent Hose Fitting (crimped or swaged) or any part thereof. Complete Hose Assemblies may only be reused after proper inspection under section 4.0. Do not assemble Fittings to any previously used hydraulic Hose that was in service, for use in a fluid power application.
- 3.6 **Pre-Installation Inspection:** Prior to installation, a careful examination of the Hose Assembly must be performed. Inspect the Hose Assembly for any damage or defects. Do NOT use any Hose Assembly that displays any signs of nonconformance.
- 3.7 **Minimum Bend Radius:** Installation of a Hose at less than the minimum listed bend radius may significantly reduce the Hose life. Particular attention must be given to preclude sharp bending at the Hose to Fitting juncture. Any bending during installation at less than the minimum bend radius must be avoided. If any Hose is kinked during installation, the Hose must be discarded.
- 3.8 **Twist Angle and Orientation:** Hose Assembly installation must be such that relative motion of machine components does not produce twisting.
- 3.9 **Securement:** In many applications, it may be necessary to restrain, protect, or guide the Hose to protect it from damage by unnecessary flexing, pressure surges, and contact with other mechanical components. Care must be taken to insure such restraints do not introduce additional stress or wear points.
- 3.10 **Proper Connection of Ports:** Proper physical installation of the Hose Assembly requires a correctly installed port connection insuring that no twist or torque is transferred to the Hose when the Fittings are being tightened or otherwise during use.
- 3.11 **External Damage:** Proper installation is not complete without insuring that tensile loads, side loads, kinking, flattening, potential abrasion, thread damage, or damage to sealing surfaces are corrected or eliminated. See instruction 2.10.
- 3.12 **System Checkout:** All air entrapment must be eliminated and the system pressurized to the maximum system pressure (at or below the Hose maximum working pressure) and checked for proper function and freedom from leaks. Personnel must stay out of potential hazardous areas while testing and using.
- 3.13 **Routing:** The Hose Assembly should be routed in such a manner so if a failure does occur, the escaping media will not cause personal injury or property damage. In addition, if fluid media comes in contact with hot surfaces, open flame, or sparks, a fire or explosion may occur. See section 2.4.
- 4.0 HOSE AND FITTING MAINTENANCE AND REPLACEMENT INSTRUCTIONS**
- 4.1 Even with proper selection and installation, Hose life may be significantly reduced without a continuing maintenance program. The severity of the application, risk potential from a possible Hose failure, and experience with any Hose failures in the application or in similar applications should determine the frequency of the inspection and the replacement for the Products so that Products are replaced before any failure occurs. A maintenance program must be established and followed by the user and, at minimum, must include instructions 4.2 through 4.7.
- 4.2 **Visual Inspection Hose/Fitting:** Any of the following conditions require immediate shut down and replacement of the Hose Assembly:
- Fitting slippage on Hose,
  - Damaged, cracked, cut or abraded cover (any reinforcement exposed);
  - Hard, stiff, heat cracked, or charred Hose;
  - Cracked, damaged, or badly corroded Fittings;
  - Leaks at Fitting or in Hose;
  - Kinked, crushed, flattened or twisted Hose; and
  - Blistered, soft, degraded, or loose cover.
- 4.3 **Visual Inspection All Other:** The following items must be tightened, repaired, corrected or replaced as required:
- Leaking port conditions;
  - Excess dirt buildup;
  - Worn clamps, guards or shields; and
  - System fluid level, fluid type, and any air entrapment.
- 4.4 **Functional Test:** Operate the system at maximum operating pressure and check for possible malfunctions and leaks. Personnel must avoid potential hazardous areas while testing and using the system. See section 2.2.
- 4.5 **Replacement Intervals:** Hose assemblies and elastomeric seals used on Hose Fittings and adapters will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Hose Assemblies and elastomeric seals should be inspected and replaced at specific replacement intervals, based on previous service life, government or industry recommendations, or when failures could result in unacceptable downtime, damage, or injury risk. See section 1.2.
- 4.6 **Hose Inspection and Failure:** Hydraulic power is accomplished by utilizing high-pressure fluids to transfer energy and do work. Hoses, Fittings, and Hose Assemblies all contribute to this by transmitting fluids at high pressures. Fluids under pressure can be dangerous and potentially lethal and, therefore, extreme caution must be exercised when working with fluids under pressure and handling the Hoses transporting the fluids. From time to time, Hose Assemblies will fail if they are not replaced at proper time intervals. Usually these failures are the result of some form of misapplication, abuse, wear, or failure to perform proper maintenance. When Hoses fail, generally the high-pressure fluids inside escape in a stream which may or may not be visible to the user. Under no circumstances should the user attempt to locate the leak by "feeling" with their hands or any other part of their body. High-pressure fluids can and will penetrate the skin and cause severe tissue damage and possibly loss of limb. Even seemingly minor hydraulic fluid injection injuries must be treated immediately by a physician with knowledge of the tissue damaging properties of hydraulic fluid. If a Hose failure occurs, immediately shut down the equipment and leave the area until pressure has been completely released from the Hose Assembly. Simply shutting down the hydraulic pump may or may not eliminate the pressure in the Hose Assembly. Many times check valves, etc., are employed in a system and can cause pressure to remain in a Hose Assembly even when pumps or equipment are not operating. Tiny holes in the Hose, commonly known as pinholes, can eject small, dangerously powerful but hard to see streams of hydraulic fluid. It may take several minutes or even hours for the pressure to be relieved so that the Hose Assembly may be examined safely. Once the pressure has been reduced to zero, the Hose Assembly may be taken off the equipment and examined. It must always be replaced if a failure has occurred. Never attempt to patch or repair a Hose Assembly that has failed. Consult the nearest Parker distributor or the appropriate Parker division for Hose Assembly replacement information. Never touch or examine a failed Hose Assembly unless it is obvious that the Hose no longer contains fluid under pressure. The high-pressure fluid is extremely dangerous and can cause serious and potentially fatal injury.
- 4.7 **Elastomeric seals:** Elastomeric seals will eventually age, harden, wear and deteriorate under thermal cycling and compression set. Elastomeric seals should be inspected and replaced.
- 4.8 **Refrigerant gases:** Special care should be taken when working with refrigeration systems. Sudden escape of refrigerant gases can cause blindness if the escaping gases contact the eye and can cause freezing or other severe injuries if it contacts any other portion of the body.
- 4.9 **Compressed natural gas (CNG):** Parker CNG Hose Assemblies should be tested after installation and before use, and at least on a monthly basis per AGA 1-93 Section 4.2 "Visual Inspection Hose/Fitting". The recommended procedure is to pressurize the Hose and check for leaks and to visually inspect the Hose for damage.
- Caution:** Matches, candles, open flame or other sources of ignition shall not be used for Hose inspection. Leak check solutions should be rinsed off after use.

~ CNG ~ - Electrically  
Conductive Compressed  
Natural Gas Hose  
3600 to 5000 psi working pressure



**A**



Part Number	I. D. in.	Max. O. D. in.	Max. Working Pressure psi (bar)	Min. Burst Pressure psi (bar)	Min. Bend Radius in.	Weight per 100 ft. lbs.	Wire Spring Guard Part Number*	Thermoplastic Guard Part Number	Crimp Fitting Series
#							#	#	
3CNG-4	1/4	0.52	3600 (248)	14400 (993)	2	6.2	3PSG-4	CNGG3-4-KIT	55
3CNG-6	3/8	0.77	3600 (248)	14400 (993)	2-1/2	15.0	5PSG-6	CNGG3-6-KIT	58
4CNG-6	3/8	0.77	4000 (276)	16000 (1100)	2-1/2	15.0	5PSG-6	CNGG3-6-KIT	58
5CNG-3	3/16	0.43	5000 (345)	20000 (1379)	1-1/2	5.0	3PSG-3	CNGG5-3-KIT	55
5CNG-4	1/4	0.62	5000 (345)	20000 (1379)	2	11.0	5PSG-4	CNGG5-4-KIT	58
5CNG-6	3/8	0.77	5000 (345)	20000 (1379)	3	17.0	5PSG-6	CNGG3-6-KIT	58
5CNG-8	1/2	0.89	5000 (345)	20000 (1379)	4	20.5	5PSG-8	CNGG5-8-KIT	58
5CNG-12	3/4	1.15	5000 (345)	20000 (1379)	7-1/2	24.1	-	CNGG5-12-KIT	58H
5CNG-16	1	1.59	5000 (345)	20000 (1379)	10	35.8	-	CNGG5-16-KIT	58H

\*Wire spring guards must be used on ANSI/CSA design certified CNG dispenser fill hose assemblies. Covers hose sizes -3 through -8; single and multi-line bonded assemblies.

Conforms to NFPA 52, ANSI/IAS NGV 4.2-1999 • CSA 12.52-M99.

**Construction:** Electrically conductive polymer core tube, two or more layers of fiber reinforcement, and abrasion-resistant urethane cover. Standard cover is perforated for use with fuel.

**Standard Colors:** Red for 3CNG, 4CNG, 5CNG. Optional green for 5CNG-X-GRN.

**Applications:** Refueling hose specially designed for conveying compressed natural gas. High-strength conductive polymer core tube formulated to dissipate static electrical buildup. (Note: Each hose assembly must be properly grounded; refer to CNG Hose Assembly Instructions). Thick urethane cover for abrasion and wear resistance.

**Temperature Range:** -40°F to +180°F (-40°C to 82°C).

Twin-line or multi-line constructions available.

**Note:** All hose assemblies must be proof tested and electrically tested per NFPA 52. Each CNG kit includes a warning tag and thermoplastic hose guards. (Refer to CNG Hose Assembly Instructions (Bulletin No. 4660-CNG-PFD-2). Wire spring guards required for AGA certification in CNG dispenser applications except 5CNG-12, 5CNG-16. See "Tooling Accessories" section in this catalog for special PSG wire spring guards.

Available as factory made assemblies only through ANSI/CSA certified Parker distributors.

**Not for use in airless paint spray applications.**

Note: CNG hose must be assembled at an approved and audited facility.







# Certificate of Compliance

**Certificate:** 209588 (112236M)

**Project:** 1175927

**Date Issued:** February 14, 2001

**Issued to:** Tulsa Gas Technologies  
4809 South 101 East Avenue  
Tulsa, OK 74146  
U.S.A.  
**Attention:** Mr. Tom Sewell

*The products listed below are eligible to bear the CSA Mark shown  
with adjacent indicators 'C' and 'US'*



**Issued by:** Jennifer Cale

**Authorized by:** George Gruss  
Operations Manager

## PRODUCTS

3313-02      HOSES (GAS)  
Compressed Natural Gas

Model Number	Type of Component	Temperature Range	Sizes	Pressure
5CNG-4-BLU-TG	Thermoplastic Hose	-40°F to 180°F	¼"	5,000 psi
5CNG-6-BLU-TG	Thermoplastic Hose	-40°F to 180°F	3/8"	5,000 psi
5CNG-6-BLU-TG	Thermoplastic Hose	-40°F to 180°F	½"	5,000 psi

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.



**Certificate:** 209588  
**Project:** 1175927

**Date:** February 14, 2001

3313-82      HOSES (GAS)  
                 Compressed Natural Gas

<u>Model Number</u>	<u>Type of Component</u>	<u>Temperature Range</u>	<u>Sizes</u>	<u>Pressure</u>
5CNG-4-BLU-TG	Thermoplastic Hose	-40°F to 180°F	¼"	5,000 psi
5CNG-6-BLU-TG	Thermoplastic Hose	-40°F to 180°F	3/8"	5,000 psi
5CNG-6-BLU-TG	Thermoplastic Hose	-40°F to 180°F	½"	5,000 psi

**APPLICABLE REQUIREMENTS**

ANSI/CSA NGV4.2-1999•CSA 12.52-M99

Hoses for Natural Gas Vehicles and Dispensing Systems

**MARKINGS**

All markings and printed instructions are in compliance with the above mentioned requirements. Samples are contained in the main certification report.



## Supplement to Certificate of Compliance

Certificate: 209588 (112236M)

*The products listed, including the latest revision described below,  
are eligible to be marked in accordance with the referenced Certificate.*

### Product Certification History

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Project	Date	Description
1175927	February 14, 2001	Original Certification. Model comparison for Parker Hannifin Corporation. Report No. 160705-1175927.

Parker Hannifin	Tulsa Gas Technologies
5CNG-4	5CNG-4-BLU-TG
5CNG-6	5CNG-6-BLU-TG
5CNG-8	5CNG-8-BLU-TG